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INTEGRATION OF INFORMATION FOR HOSPITAL RATE SETTING

VOLUME 2: HOSPITAL INFORMATION SYSTEMS
IN THE PROVINCE OF QUEBEC

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INTEGRATION OF INFORMATION FOR HOSPITAL RATE SETTING

VOLUME 2: HOSPITAL INFORMATION SYSTEMS IN THE

PROVINCE OF QUEBEC

by

Karin A. Dumbaugh

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PREFACE

This is the second in a series of working papers in a project whose task is to explore the types of information required to permit equitable hospital rate setting in the United States, and the obstacles to their access, integration, and use.* Most of the papers in the series examine one or another specific obstacle that appears to interfere with access to the required data by U.S. rate setting bodies, or that impedes efforts to improve their quality and usefulness.

This paper approaches the problem from a different vantage point. It reports a segment of experience in Canada, where various forms of hospital rate setting have for some years been practiced in the different provinces in attempts to control hospital costs that have been rising at rates comparable to those in the United States.

The study documents in detail the kinds of information currently being collected for the reimbursement and planning of hospital services in Quebec, showing how the information systems were designed, how they are currently being used, where problems appear to lie, and where changes are likely to be made in the future. It also shows the division of decision-making powers between the federal and provincial governments in respect to information specification and reporting.

It is hoped that this analysis will allow the designers of information systems constructed for comparable purposes in the United States to take advantage of the many successful features of the Quebec and the broader Canadian experience, while avoiding the pitfalls that have been encountered.

Of course, important differences in social and political organization between one country and another preclude the usefulness or feasibility of adopting any model wholesale. The reader will immediately discover characteristics of the provincial government organization in Quebec that are poles apart from the usual structures of state government in the United States. Also, since hospital insurance in Canada is universal, not

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piecemeal, the familiar U.S. problems associated with setting rates for multiple payers are absent. On the other hand, the tradition of private voluntary hospitals, the structure of the medical profession, the fee for service system, the ethnic diversity in Quebec offer a more comparable set of circumstances than is to be found in most European countries. Finally, as the author gets down to the kinds of issues that budget approvals and hospital expansion plan approvals involve in Quebec, the reader who is familiar with comparable experience in the United States will find many more parallels than differences in the kinds of information required to aid in policy and decision making.

Katharine G. Bauer

Harvard Center for Community Health
and Medical Care

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INTRODUCTION

It is often assumed that one prerequisite of a governmentally financed and administered health care delivery system is the establishment of an integrated multi-purpose data base. This base, it is thought, can be broad enough to provide an overview of the system, yet at the same time specific enough, for example, to be of use to organizations carrying out such diverse functions as reimbursement to providers, and planning the scope of the overall delivery system. Not only is it advocated that such a data base contain the information from which multiple users derive routinely required analyses, but that it also accommodate ad hoc research projects, as the need for them arises. Two methods are envisaged generally to allow for such flexibility, 1) that the minimal data requirements be aggregated in such a way as to allow for special purpose decomposition of the data into its modular components; and 2) that the data collection instruments (forms, questionnaires) can be expanded to respond to particular information needs.¹

Theoretically, then, it is this aspect of a deliberately created data base, i. e. the provision of integrated and compatible information, that permits "rational planning" in a third party financed and/or administered system, as distinct from a "muddling through"² approach to planning in a mixed system, such as we might have observed in the 1960's in the hospital sector in the United States.

The case of hospital reimbursement by third parties and of projections of the demand for hospital beds by Certificate of Need Programs may serve as an example of "incremental planning" and of multiple uses of the same data base. In the United States we observe that a few Certificate of Need bodies currently use some information originally collected for reimbursement purposes, and vice versa.³

As more and more hospitals are reimbursed according to prospectively established rates or budgets, as Medicare reimbursement constitutes approximately one third of an average hospital's budget, and as information is

also required by other organizations that deal with hospitals, the establishment of one multi-purpose hospital information system is considered both more necessary and more feasible by some management information system (MIS) experts. Walter Keenevan defines an MIS as:

an organized method of providing past, present and projected information relating to internal operations and external intelligence. It supports the planning, control and operational function of an organization by furnishing uniform information 4 in the proper time-frame to assist the decision making process.

The question of how information exchange should be organized has been hotly debated. The concept of the total integrated data bank, common in the mid-1960's has by now been widely challenged. John Deardon, commenting from the perspective of a firm (or hospital) manager observes:

Some years ago I expressed the opinion that of all the ridiculous things that have been foisted on the long suffering executive in the name of science and progress, the real-time management information system is the silliest. . .even sillier (is) the current fad for the . . .Total Management System, or simply MIS.

I certainly do not mean to suggest that a company does not need good management information systems - nothing could be further from the truth. But the notion that a company can and ought to have an expert (or a group of experts) creat for it a single, completely integrated super system - an "MIS" - to help it govern every single aspect of its activity is absurd.⁵

For a firm, John Deardon advocates several information systems; the financial accounting and control system; the logisitics information system; the marketing information system; an information system for legal services, industrial relations and public relations; and a Research and Development reporting system. Those supporting such separate data systems, feel that the main requirement, apart from competent staff, is the establishment of interfaces between these information banks. In terms of data bases needed for hospital management and planning, such information systems do not require that all data related to hospitals be coded uniformly, or that cross-references be provided for every single piece of information. However, where interfaces have to be established, cross-references must be provided so that information can be compared and added to other data banks.

In this study the integration of information generated by the hospital sector is analyzed in the Medicare Program in Canada, more specifically, the program as implemented in the Province of Quebec. Although the organizational mechanisms for the delivery of care resemble those of the United States, the financing and planning of health care in Quebec can be thought to be at a point in time which very well might be comparable to where the U. S. health care system will be in several years. Thus, all inhabitants of the Province are covered for medical and hospital care. This care is financed through payroll deductions and from general revenues and provided without charge at the point of delivery. Physician services are reimbursed on a fee-for-service basis, while hospitals are financed on the basis of global budgets.

Planning and financing functions are carried out by the Ministry of Social Affairs (M.A.S.) of the Government of Quebec. A commission, the Castonguay-Nepveu Commission of Inquiry on Health and Social Welfare, (see page 6) provided much of the evaluation and planning expertise for this health care delivery system. It was also instrumental in the design of the information system instituted by M.A.S. to evaluate hospital performance and to finance their operations.

This information system is of interest to the U.S. for the following reasons: 1) since 1970 Quebec has succeeded in implementing a workable system of collecting, analyzing and disseminating the information that had been specified as needed - a remarkable achievement. 2) Now, five years after this initial implementation, as its designers had envisaged, there is an evident need to change the information system to meet the new requirements of the evolving financing and control system.

The initial short-term objective of the health care financing plan in Quebec was to keep the hospitals financially solvent. Currently, attention is directed towards the effectiveness and efficiency with which the hospital sector delivers care. This change in emphasis from financing institutions to managing scarce resources is accompanied by a shift in

emphasis of the information system from cost data per unit of service that is produced, to broader and more complex performance measures that include information on the appropriateness of the units of service provided to a given patient mix. The Castonguay Commission had anticipated that patient data mix would be required. What the Commission did not foresee was an apparent change in the perception of users, and the degree of detail of statistical data that they would come to consider desirable. Therefore, while the initial thrust was to collect information pertaining to institutions, now information systems are being considered which allow the analysis of consumer behavior by type of case as well as by the physician who is in charge of the case.

It is also important to note that the Ministry of Social Affairs has consciously applied cost/effectiveness principles in deciding which data to collect continuously and what other data to acquire only sporadically. These considerations have been adhered to from the very outset of the planning effort.

To enable the reader to relate the structure and process of the information systems to the objectives of the hospital sector of the health care delivery system, a brief analysis of hospital care delivery and financing in the Province is provided in Chapter I. Chapter II then deals with the analysis of information systems. Part 1 provides an overview of the structure and the organization of the information system. Part 2 describes the process by tying objectives in the evolution of financing to the parallel evolution of the information system. In Part 2a routine reports are described, as well as routine efforts at integrating data requirements. Part 2b provides an overview of ad hoc requirements and the system's response. In 2c problems of input/output relationships of health care data accuracy, and attempts at improving the data base and user interaction are described. The Summary provides an overview of the findings and concludes with recommendations derived from the analysis of the integration of the hospital information systems in Quebec.

An appendix has been added for the benefit of those not familiar with the social, political, economic, and geographic environment of the Province.

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3. Bauer, Katharine G. and Altman, Drew, Linking Planning and Rate Setting Controls to Contain Hospital Costs. Division of Resource Development, Department of Health, Education and Welfare Region II, New York, N.Y. December 1975.
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CHAPTER I

ANALYSIS OF THE HOSPITAL CARE DELIVERY AND FINANCING SYSTEM IN THE PROVINCE OF QUEBEC

1. The Historical Development of the System

The Federal Government of Canada first proposed that hospitalization be a covered service for all Canadian residents in 1948. In 1957 it then passed the Hospital Insurance and Diagnostic Services Act. The Province of Quebec extended hospitalization coverage to its residents in 1961. The broadening of coverage to include physician services was first recommended by the Canadian Royal Commission on Health Services in 1961. The Medical Care Act of the Federal Government was passed in December 1966. According to most interpretations of the British North America Act, health is a provincial responsibility. However, the Federal Government provides an incentive to the Canadian Provinces to insure their residents by matching provincial expenditures on health care and by setting some standards for the participation of Provinces. Standards include a 95 per cent participation rate of the eligible population, extensive benefits which are portable within Canada, and administration of the medical insurance fund by a public body. In the Province of Quebec a bill to provide medical coverage (i.e. for physician services) was first introduced in 1970, and then Bill 8 was passed in 1971. The Regie de l'Assurance-Maladie du Quebec (RAMQ) administers physician reimbursement (L.Q. 1969, c. 53, June 13, 1969).

Before Bill 8 was passed the Provincial Government felt that a thorough investigation of the existing delivery system, its resources in manpower and institutions, and its needs was in order. The Castonquay-Nepveu Commission of Inquiry on Health and Social Welfare was appointed to study not only the existing delivery system, but also to propose its reorganization both in terms of care and administration. The Commission reported its findings and recommendations in 1970. Claude Castonquay (the head of the Commission) was elected to the legislature and subsequently

appointed Minister (M.A.S.). (A "Minister" can be equated with an elected Secretary.) The Ministry was created by the merger of the former Health Ministry and the Ministry of Family and Social Welfare through the law of the Ministry of Social Affairs of Dec. 22, 1970. In 1971, Minister Castonquay and several other members of the Commission (who were appointed to positions in the Ministry) started to implement the Commission's Report. Thus Bill 65 was passed on December 24, 1971. It affirmed that every Quebec resident has the

right to receive adequate, continuous, and personal health services... allowing residents... to choose the professional or institution from whom or which he wishes to receive health services or social services. Paragraph 3, Sect. 4 ff.

The bill then proceeded to outline a regionalized administrative network within which the residents' rights to health care and Social Services can be realized. The bill provided for the establishment of regional health and social service councils, whose most important functions were to operationalize the participation of the population in defining its needs and in the administration of institutions (Bill 65, Div. II, Paragraph 1 and Div. III, Paragraph 1).

From this brief description it is clear that there are historical reasons for the way the Ministry of Social Affairs (M.A.S.) has organized hospital reimbursement, planning, and programming, and for the fact that the Regie d'Assurance Maladie (RAMQ) which is responsible for physician reimbursement, is only loosely tied to M.A.S. There is a movement which will tie RAMQ more closely to the Ministry. In the long-run it may become part of M.A.S. (The organization of the health services administration and delivery system is detailed further in 1.3.)

2. The Size of the Health Services Sector

The Provincial Quebec Government spends a considerable portion of its revenues on what it calls its "Social Mission" program. The 1975-76 fiscal

plan provides that roughly 30 percent (or \$ 2,888.0 Mil. of \$ 8,225.0 Mil.) of the total provincial budget be spent on "income security, health, and social adaptation, and housing", the component parts of the Social Mission Program.⁶

Table 1: Expenditures on Health and Social Adaptation in Perspective.

Program	1975-76 Budget (\$ 000)	1974-75 Prelim. Est. (\$ 000)	1973-74 Actual (\$ 000)	1972-73 Actual (\$ 000)
Economic Mission (Development of Natural and Human Resources, Services, Secondary Industries, and Transportation)	1 226.8	1 188.9	960.4	847.5
<u>Educ. & Cultural Mission</u>				
Educ., Cult., Sports, Recreation	2 308.9	2 110.0	1 619.7	1 434.5
<u>Gov. & Admin. Mission</u> (Political Institutions, Central Admin., Inter-governmental Relations, Protection of Persons and Property	1 689.1	1 351.1	1 078.5	904.0
<u>Social Mission</u>				
Income Security	663.6	586.3	508.5	477.5
Health and Social Adaptation	2 155.2	1 844.1	1 491.1	1 341.7
Housing	69.3	44.6	38.2	38.9
(Subtotal: Social Mission)	(2 888.2)	(2 475.0)	(2 037.8)	(1 858.1)
(Total: M.A.S.)	(2 788.7)	(2 401.2)	(1 979.6)	(1 808.6)
<u>TOTAL</u>	<u>8 225.0</u>	<u>7 125.0</u>	<u>5 696.4</u>	<u>5 044.1</u>

Source: Adapted from R. Garneau, Budget Speech 1975-76 (Quebec: Government of Quebec, Dept. of Finance) April 15, 1975, p. 69.

(Provincial revenues are derived from State Industries (7.8 percent), permits (4.7 percent), taxes on consumption (22.8 percent), refunds from the Federal Government (26.8 percent), and taxes on income and wealth (37.9 percent).)⁷

The Ministry of Social Affairs is responsible for Income Security and Health and Social Adaptation. Income Security includes family and educa-

tional allowances, welfare, and pharmaceuticals for Quebec residents with low incomes. The Health and Social Adaptation program of M.A.S. has four components, 1) Prevention and Improvement (Community and School services, aid to voluntary agencies), 2) Social Readaptation (mental and other handicaps, lodging, and equipment), 3) Health Recovery (specialized and ultraspecialized mental and physical care, long-term care, convalescent care, and equipment, all for institutions), 4) Administration and Direct Services (research, development of intervention methodology, administration of M.A.S.).

Since the Administration of Health and Social Services are combined in one Ministry, the breakdown of administrative costs for the personnel in M.A.S. which is in charge of hospital reimbursement only is not easily available. The amount budgeted for administration of the Ministry is \$43,375,100 for 1975/76 on a total budget of \$2,888,169,000 (or 1.5 per cent).* Only for operational and equipment outlays of health care institutions is further detail available.

Table 2: Outlays for Health Care Institutions, by Category of Expenditure

	1975/76** Appropriat.	1974/75 Estimated	1973/74 Actual	1972/73 Actual
Specialized and ultra-specialized care	1 226 939.4	1 093 625.2	882 989.9	821 741.7
Extended care	147 839.5	126 533.6	104 558.5	99 434.5
Health Serv. Equipment	128 628.9	101 159.6	99 627.1	82 494.0
TOTAL	1 503 407.8	1 321 318.4	1 087 175.5	1 003 670.2

Source: National Assembly, Credits 1975/76, Ending March 31, 1976
(Quebec, P.Q.: Editeur Officiel du Quebec) 1975 p. XXVI.

* The data one would wish to have is the total cost of all Departments within the Ministry which deal with health institutions. All we know presently is that that amount is in excess of 1.5 per cent of total outlays for health care institutions.

** Because of salary offers in labor negotiations this amount of funds appropriated will be far below the actual expenditures. They will be about \$1 700 000.

These amounts do not include payments for physician services which are made from a special fund by an organization, which derives its policy from M.A.S., but is otherwise an autonomous body, the Regie d'Assurance Maladie (RAMQ). RAMQ spent more than \$457 Million in 1973/74. Of this amount roughly \$410 Million were payments to physicians, administrative costs amounted to about 22 Million \$ or 5.3 per cent of the remuneration to physicians.⁸ The average cost per inhabitant for hospitalization and physician coverage is detailed in Table 3.

Table 3: Average Cost per Inhabitant for Hospitalization and Physician Care

	1971 \$	1972 \$	1973 \$	1974 \$
Hospitalization ^a	107.80	118.54	133.83*	N.A.
RAMQ ^b				
Physicians	45.44	49.91	55.18	61.25
Oral Surgery	.08	.48	.47	.48
Optometry	.16	.18	1.72	1.91
TOTAL	153.48	169.11	191.20	N.A.

* preliminary

^a from Jacques Lefort, Performance of Hospitals 1966-72, 1973 Preliminary (Quebec: Ministry of Social Affairs, Financing Dpt.) August 1974, p.47.

^b RAMQ, Statistiques (Quebec: Service de la recherche et des statistiques) 29, January 1975, Annex I., p. 13.

Institutional Resources

In 1973 the Province of Quebec had 214 public and private hospitals. Of these 49 have more than 300 beds and 33 have an annual operating budget of more than \$10 million. The hospitals had 29,000 beds*, which provided 7,721,177 patient days in 1973 (or 26.9 admissions per "set up" or "dressed" beds).⁹ Labor constituted more than 70 percent of total hospital costs. (For 1974 it was 74.4 percent, and for 1975 it will be above 80 percent.)

* "Theoretical capacity" calculated by dividing space of hospitals available for beds by theoretically necessary square footage per bed. Actual number of "dressed beds" was 27,364 or 95.1 % of theoretical capacity. J. Lefort, op.cit. p.23.

A different breakdown is presented in Table 4, which gives the percentage costs incurred by the department which produced the service.

Table 4: Percentage of Total Hospital cost, Incurred by Service 1972

TYPE OF SERVICE	Percentage of total cost
Nursing	31.0
Special Services:	21.0
Laboratory	8.0
Radiology	6.0
Other	7.0
General Services	39.0
Gnl. Administration	14.0
Nutrition	8.0
Housekeeping and Maint.	13.0
Other	4.0
Teaching	3.0
Med. and Surgical Supplies	3.0
Drugs	<u>3.0</u>
TOTAL	100.0

Source: Performance of Hospitals, 1966-72, 1973 Preliminary (MAS, Financing Department) August 1974, p.62, 63, 64, 65.

Comparing Quebec to Ontario, Quebec has fewer patient days per resident, a generally longer length of stay per diagnosis (on the average LOS is by about 1 to 2 days longer than Ontario's average length of stay of 9.0 days), lower hospital occupancy rate (1973: 77.3 versus 81.3 per cent), and higher costs per patient day.⁹ If one assumes that the case mix is not very different, it would follow that the cost per case is higher in Quebec than in Ontario. There are two factors which could account for case mix differences, one, the concentration of teaching hospitals in Quebec, and two, the regional referral patterns, where patients from the Eastern Provinces often may be referred to Quebec.¹⁰ It is known that the proportion of surgical cases to medical cases was higher for Quebec than for Ontario in 1975, and it is thought that this fact contributes to the

strikingly longer LOS for specific diagnostic categories, and to the higher costs in Quebec. Thus, the average length of stay for kidney patients is 196.7 percent that of Ontario. Other factors for LOS differences are the lack of extended care beds, and the distance some patients must travel to reach the hospital. Physicians in such cases may wish to discharge patients only when the risk of later complications is minimal. Patients with senility stay 208 per cent as long in Quebec as in Ontario.

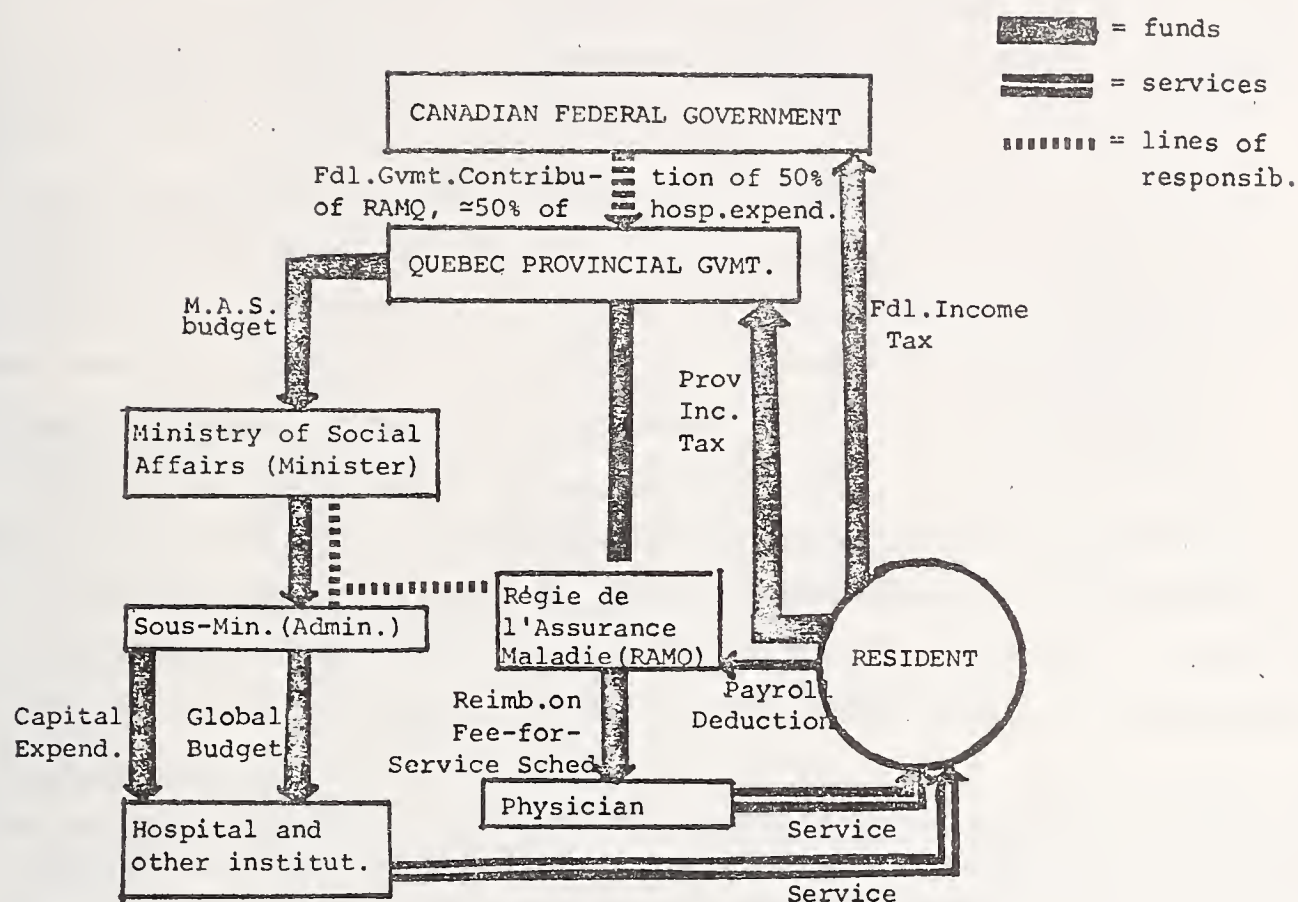
Apart from possible differences in patient mix, which affect the per capita cost for hospitalization because of longer lengths of stay, and possibly because of higher per diem outlays, one important reason for the difference in the cost per patient day seems to be that Quebec hospitals utilize more personnel hours per patient day than Ontario hospitals.

As a result of all these factors affecting costs, the expenditures per resident for hospitalization in 1974 were higher in Quebec than in Ontario (\$133.83 versus 130.37), and were only slightly lower in 1975.¹¹

3. The Organization and Financing of Health Care Delivery

In Figure 1 a very simplified diagram of the flow of funds into the hospital and medical care sectors is depicted. The Resident of the Province pays provincial, as well as federal taxes. In addition, he contributes .8 of 1 per cent (or \$125, whichever is less) of any income above 5,200 \$ for married or 2,600 for single taxpayers to RAMQ through a payroll deduction.¹² RAMQ reimburses the physician for services rendered on a fee schedule basis. (This fee schedule is negotiated by the various federations, or unions, of physicians with the Ministry of Social Affairs). The Ministry receives a 50 per cent subsidy for RAMQ from the Canadian Federal Government. The patient receives services from the physician and the hospital or other health care institution on the basis of his or her residency status, without charge at the point of delivery of services. The hospital provides its services within a global budget which is established prospectively by the M.A.S. (More about the hospital financing process in 1.4.)

Fig. 1: Flow of Funds and Services in the Health Care Sector



The Federal Government of Canada out of its general revenues pays for approximately 50 percent of total hospital expenditures.* It pays 25 percent of the average Canadian per capita hospital expenditure plus 25 percent of the average provincial per capita expenditure. The sum of these two per capita amounts is then multiplied by the population of

* This pertains to admissible costs only. Non-admissible costs amount to about \$200 Million in 1975, or 15 per cent of the total expenditures on hospital care. In 1975 the Government contributions amounted to 47 per cent of total expenditures, because of high capital costs in Quebec.

the Province to arrive at the total amount to be contributed by the Federal Government to the Province.*

The Organization and Financing of Institutional Services

As was already discussed**, M.A.S. is responsible for social, as well as health services. Here we will only discuss the health services mission of the Ministry. (Again, the reader is reminded that the Ministry has policy responsibility for RAMQ, which is in charge of physician reimbursement))

Within M.A.S. several objectives have to be met by the organizational structure in order to maintain efficient, and effective hospital services:

- 1) Maintenance of the liquidity of hospitals.
- 2) Controlling total expenditures on hospitalization (including capital expenditures), so that they stay within a budget established by the Treasury. This budget limit is based on total projected revenues and allocation of funds to other "missions".
- 3) The assurance of quality care.
- 4) The evaluation of the system, developing and implementing new services, and terminating those services which are unacceptable on the basis of medical and or cost-effectiveness criteria.

The organization of M.A.S. takes account of these functions of the Ministry.***

* This method of calculating the Fdl. participation in the expenditures will provide some subvention to those Provinces which spend less by giving them 25 per cent of the average Canadian per capita expenditure on hospital care, but it also takes into account in the other 25 per cent of the total amount that the Province may face cheaper labor and capital markets. There was some thought that this formula may work to stimulate an overall optimal amount of expenditures, i.e. that it will be conducive to cost containment in those Provinces which spend more than the average, and that it will bring Provinces with less expenditures up to the average. Studies of the tax incidence of these expenditures were not available when the material for this report was gathered.

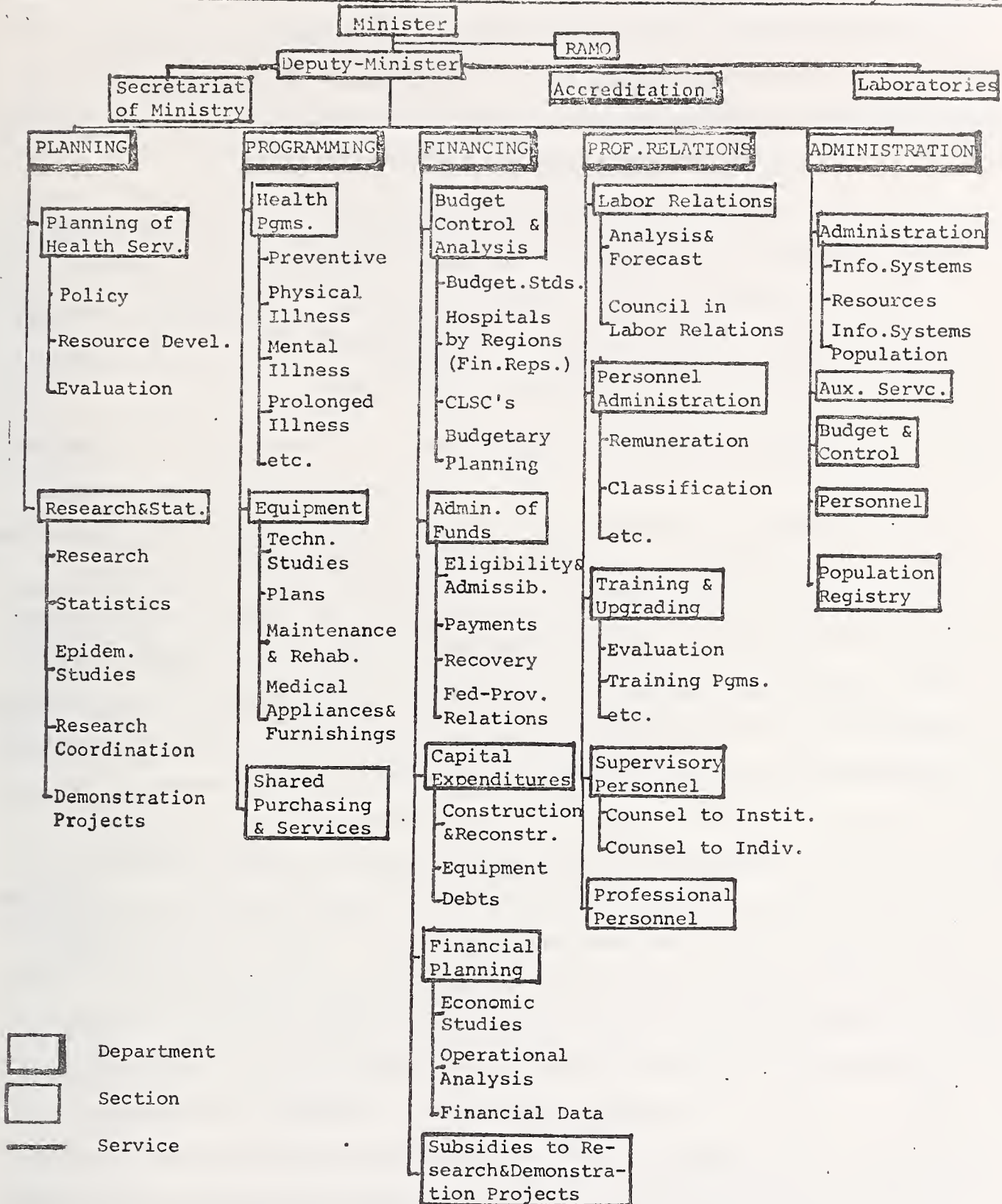
** on p. 9.

*** Here all references to the Social Service mandate of the Ministry have been removed from the organization chart, so as to simplify the analysis. In essence, one need simply imagine a quasi-mirror image of the departments dealing with 'health services', and that would approximate the total Ministry of Social Affairs.

References to institutions other than hospitals are also omitted, because this analysis focuses on hospitals. For the reader interested in other institutions let us mention that a similar budgeting, financing, and general information process is in effect for all other institutions, long-term and extended care facilities and neighborhood health centers, etc.

Figure 2

Organization Chart of M.A.S. (Ommitting Social Services and Income Security Functions, 1975)



The Ministry was reorganized in late 1975. It remains to be seen how this reorganization affects the flow of information.

The Financing Department

The Financing Department is in charge of forecasting the costs of health and social service programs, it studies and approves budgets, and controls the institutions' reimbursement of operating expenses and capital expenditures, once the budgets have been approved.

In order to carry out this mandate, Financing is divided into four sections: 1) Budget Analysis and Control, 2) Administration of Funds, 3) Capital Expenditures, and 4) Financial Planning. In addition there is the "Service of Subsidies to Research and Demonstration Projects", which selects and administers grant projects to hospitals.

The core of the Financing Department which is responsible for hospitals existed even before the creation of M.A.S. Its objectives have changed, as well as its method of reimbursement. Initially, hospitals were reimbursed on a line-item budget basis, and the main objective was to reimburse hospitals correctly and speedily for the amounts they spent on patient care. In 1971, M.A.S. and 23 hospitals experimented with a global budget. In 1972 this reimbursement method was extended to all hospitals in the Province. The objectives of the Department then were expanded, and are now 1) to leave the day-to-day administration of hospitals to the administrators, 2) to achieve hospital liquidity, and 3) to control hospital expenditures. Leaving the day-to-day administration of hospitals to administrators, "to free up M.A.S. for a more global perspective of the institutional sector,"¹³ was a major change in the Department's objectives. This means that the hospitals submit a yearly prospective budget for operating expenses. Except for some protected items the hospital administrator then is able to shift his resources as the situations demand. The hospital's freedom to work within the budget of operating expenses is limited by two factors, 1) the hospital must respect the union wage scales approved by M.A.S., and 2) the hospital cannot reduce or abolish a service without M.A.S. authorization. Budget Analysis and Control analyzes budgets, establishes annual operating budgets, and controls the hospitals' financial administration.

To carry out some of the control functions, and to act as link between the hospitals and the Financing Department, Budget Analysis and Control employs Financial Representatives. These employees usually have an accounting background and are responsible for approximately 10 hospitals each. They represent the hospital before the Ministry, but also represent the M.A.S. before the hospital. The financial representatives (Representants Financiers) were first called 'financial advisors', and I was told by them and by some hospitals that the hospitals still feel generally that the financial representative is working for them. Their mandate from their employer, the M.A.S. is to assure that the hospitals follow the law, but also to plead the hospitals' case with the Ministry, because the financial representatives are closer to the actual operation of the hospitals than other employees of the Ministry.

Since the global budget applies to operating expenses only, capital expenditures are projected separately, and dealt with by the Capital Expenditure Section of the Financing Department. It administers the financial aspects of capital expenditures only, for renovations, new construction and equipment. The technical aspects of determining the type and size of capital expenditures are handled by the Programming Department.

In order to free up M.A.S. from the day-to-day supervision of hospital activities, the second major objective of the Financing Department is to achieve hospital liquidity. The budgeted amounts are disbursed periodically by the Administration of Funds Section of the Department, according to a Cash Flow Analysis submitted by the hospitals along with their budgets. The Administration of Funds Section is also in charge of supervising the Federal-Provincial financial arrangements.

The third major objective of the Financing Department is to control hospital expenditures. The Financing Department has been using four approaches to reach that goal: 1) selective approvals of capital expenditures requested by the hospitals,¹⁴ 2) tying automatic increases in

budgets only to price index changes for supplies and to labor cost increases, without allowing for other changes in operating costs, 3) comparing actual disbursements during the year by the hospital to budgeted disbursements, 4) comparing hospitals on the basis of activity centers, and selecting target areas for cost reductions.

Tying the automatic budget increases to price index changes, allows the Ministry to forecast closely what the total hospital expenditures will be during the year, particularly since a 1975 M.A.S. directive states that no supplementary funds will be provided for operating expenditures. Initially, supplementary budgets had been granted in "circumstances absolutely beyond control, and...if major adjustments (were) necessitated by an increase in volume of activity due to circumstances from without."¹⁵ Indications are that hospitals finance their operating deficits by borrowing funds from banks, and that eventually M.A.S. will have to fund the difference.

The requirement that a hospital keep within its prospectively established budget, and checking the adherence of the hospitals to the budgeted amounts during the fiscal year, lets the Ministry control total outlays very closely for each budget year. However, this is no guarantee that hospitals are producing services cost-effectively. Conceivably, using 1970 as the reference year on which all future reimbursement increases are based, could lead to inequities if hospitals operated at different levels of efficiency during that base year. That is why hospital activity centers are compared, and inquiries are made when the cost per unit of output in a hospital activity center is very different from all other hospitals. The operational activities of actually contacting hospitals and discussing differences in activity center costs are carried out by Financial Representatives in the Budget Analysis and Control Section. The decisions on how to calculate comparable indicators, the establishment of homogeneous groups of hospitals for purposes of evaluation, the forecasts of total expenditures, the calculation of the cost increase index which is applied to the base budget, and any other analyses or forecasts including long-term

estimates of expenditures are carried out by the Financial Planning Section.

The Financing Department was described first, because it presently edits or otherwise deals with most of the information collected by M.A.S. from institutions. However, as already discussed, there are many other Departments which contribute to the M.A.S. objectives of controlling total expenditures on hospitalization, assuring quality of care, and evaluating the success with which the system meets patient needs.

The Planning and Programming Departments

Although both of these departments are of considerable size, they are discussed together here, because they supplement each other. Planning is charged with the analysis of the population's health, social service and income maintenance needs, the development of appropriate programs, personnel, and other resources, and the evaluation of the impact of such programs. In addition the mandate of the Planning Department calls for the development of social and health status indicators, and of forecasting and simulation models. One of the very important objectives of health planning is to implement the regionalized network of the provision of care, which was advocated by the Castonguay Report. It was anticipated that providing care without charge at the point of delivery of services would lead to much greater utilization of care, and possibly would overload the system as it existed. Therefore, a network was envisioned which would screen patients at the neighborhood level in community clinics, and then allow for referral to specialists or hospitals. Hospitals as well were to offer different levels of care, and would refer patients to the next level of services and facilities as the need arose.¹⁶ The Planning Department, then, was to be responsible both for this overall reorganization of care, as well as for any other changes that needed to be made in the system.

One of the Sections of Planning, is Research and Statistics which prepares planning and evaluation studies, health status indicators,

and forecasting models. It identifies and inventories available data, develops systems to make the information which is already collected accessible, and integrates data banks as the need arises. The Service of Epidemiological Studies has a free hand to develop its own priorities for studies and recommendations. It has so far worked with mortality and morbidity information, and has contributed substantially to the closing of maternity services which were freestanding, and/or did not perform a sufficient number of deliveries to safeguard good quality care.

Programming, as distinct from Planning, is charged with the implementation of plans. It does not initiate programs on its own, but carries out what has been recommended by Planning. Its Equipment Service, for example, supervises the technical aspects of new construction, renovation, and purchases of equipment. Its Shared Services Section has a mandate to foster coordinated purchasing of supplies by hospitals and to consolidate such services as laundry and laboratories, so as to decrease costs.

The Professional Relations Department

The importance of personnel costs in hospital budgets has been outlined before. The Professional Relations Department thus has a very important influence on 75 per cent of the operating expenditures of hospitals, which is the percentage of the costs directly attributable to personnel. Professional Relations is responsible for labor union negotiations. It also contracts with the unions of professionals, and is responsible for a framework of supervisory personnel development. The Department also ascertains that the conventions are applied and acts as mediator in labor disputes. In addition, it serves in a consulting capacity to the Ministry on questions of personnel administration and upgrading. When hospitals are closed or take on different functions, for example when maternity care departments were transformed into long-term care units, the Professional Relations Department helps in the relocation or retraining of employees.

The Hospital Accreditation Department

This department supervises the participating agreements of hospitals. Its main function is to insure the quality of care in institutions. It prepares norms and standards for the assurance of quality of care, sanitary conditions and security. Periodically, the Department then inspects the hospitals to examine whether the regulations are followed, and then it grants, renews, modifies, suspends or revokes hospital operating permits.

Four services carry out the Department's work: 1) Establishment of Standards, 2) Inspection of Health Care Institutions, 3) Granting of Permits, and 4) Security Measures (including disaster and emergency plans.)

The Department of Administration

This Department acts as a support department to the Ministry's Departments in personnel matters and data processing. Its administrative section is charged with the development of an integrated financial and operational information system which is capable of responding to the Ministry and to the institution's needs. It also acts as consultant to the Minister on the development of data processing capabilities, it standardizes data processing of information, and generally aims to improve the efficiency and efficacy of the procedures used in administration and data collection and processing. The Department's services support the Ministry's work on all levels, from the management of offices to the preparation of the M.A.S. budget, to the development of human resources at the Ministry. It also supervises the Population Register.

Chapter I: References and Notes

6. Raymond Garneau, Budget Speech 1975-76, (Quebec: Government of Quebec, Department of Finance), April 15, 1975, p. 69.
7. Ibid. p. 70.
8. Regie d L'Assurance - Maladie du Quebec, Rapport Annuel 1973/74, (Quebec: Editeur Officiel du Quebec), 1974.
9. Jacques Lefort, Performance of Hospitals 1966-72, 1973 Preliminary, (Quebec: Ministry of Social Affairs, Financing Department), August 1974.
10. Notes of meeting of Claude Forget with professionals from Harvard, McGill, Sherbrook, and Laval Universities, (Jan.-Feb. 1973 at Laval University.)
11. Jacques Lefort, op. cit. p. 47.
12. Ministry of Revenue, Guide de la Declaration du Revenu des Particuliers, 1974, p. 38.
13. Castonguay, Claude, Introductory Letter to Budget Guide 1972, (Quebec: Government of Quebec, M.A.S. Department of Finance), 1971, p. 7.
14. The Ministry is not only interested in making the internal operation of hospitals more effective, but also in improving the efficacy and efficiency of the total health care system. Regionalization of services, therefore, is one of its objectives. This is in addition to the internal cost control programs implemented by the Financing Department. The Planning Department has consolidated and regionalized services. Notable examples are the consolidation of maternity services, and the conversion of freed-up beds into long-term care beds. More detail is provided later in this paper.
15. Forget, Claude, 1972 Budget Guide, (Quebec: Government of Quebec, M.A.S., Department of Finance), 1971, p. 71.
16. See also: Dominique Clift, "Pressures on Health Services Building Up to a Crisis," Montreal Star, February 15, 1975.

CHAPTER II

THE ANALYSIS OF THE HOSPITAL INFORMATION SYSTEM

1. The Structure of the Hospital Information System

The structure of the hospital information system can be discussed from different perspectives. For example, the focal point could be each hospital. The analysis then would cover the flows of information from the hospital to regulatory and financing bodies, and their feedback to the institution. Another possible approach would concentrate on each case treated in each hospital and the information structure that permits the evaluation of the performance of the hospital in dealing with each case. For the purpose here of documenting the integration of information flows, and the application of such a system to third party or government reimbursement and regulation, the analysis of the hospital information system will focus on the information required, obtained, generated, and disseminated by the Ministry of Social Affairs.

The Ministry, in its capacity as financing agent for the Provincial and Federal Governments, and in pursuit of its mandate of managing health resources efficiently, exchanges information with the providers of care, with the Provincial and Federal Governments, and from time to time with consumers. Providers, in this context, are not just each of the hospitals in the Province, but also the hospital association, the Federations and Colleges of Physicians, and other professional employees, and the labor unions of non-professional employees.

The bulk of the information flows from the hospitals to the Ministry and consists of data on the operation of the institutions, such as 1) financial data, 2) resource complexity (types of services and facilities), 3) overall output data by activity center, 4) structural measures of quality of care, and 5) a host of miscellaneous information. Patient Discharge data is generated by hospitals, processed by M.A.S., and summaries are produced by Statistics Canada. As already indicated, data of services

provided by physicians in all hospitals is available from RAMQ only. M.A.S. does collect data on physician services in University hospitals for RAMQ.

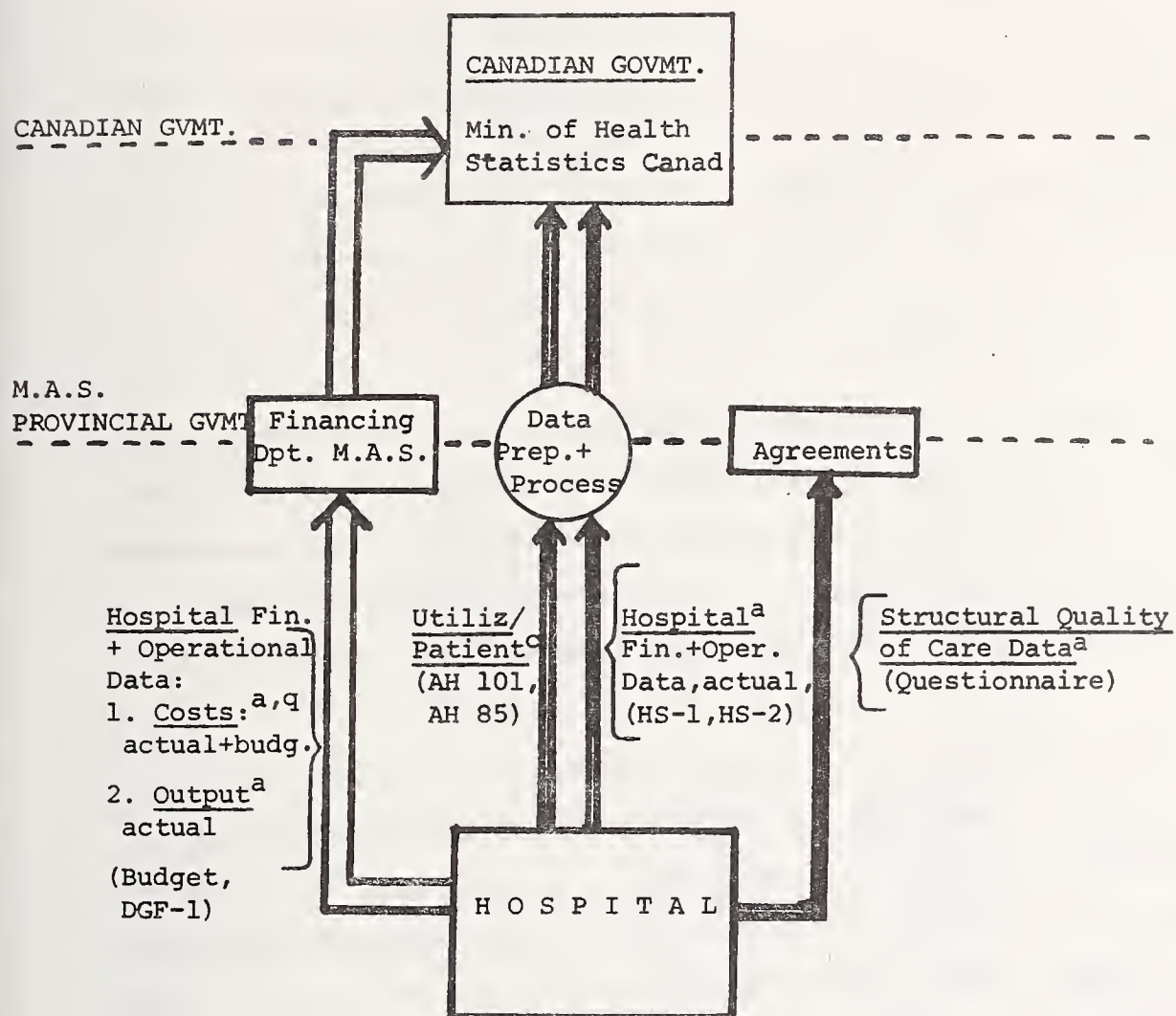
Fig. 3 diagrams the essential features of the hospital information system. On the provincial level the Financing Department in the Ministry receives the bulk of the hospital financial and operational data. As far as costs are concerned, a distinction is made between actual and budgeted costs. On an annual basis costs are projected in a prospective budget, and a budget form is completed. In addition, the annual financial report of establishments is completed, the DGF-1. This set of forms contains actual cost data, as well as information on units of output by activity center. It will be detailed later.

On a quarterly basis the hospital reports actual expenditures to the Financing Department. These are then compared to budgeted expenditures.

The Annual Return of Hospitals consists of two sets of forms, the HS-1 and the HS-2, which are required by Health and Welfare, Canada, as well as by Statistics Canada. Form HS-1 contains information on facilities and Services, while Form HS-2 provides financial data.* At first glance parts of these two forms seem not unlike the DGF-1, and may even appear to ask the hospital for duplicate information. However, even though there are many overlapping items, conceptually they are quite different. The different focus can best be illustrated in an example which compares the DGF-1 and the HS-1, diagnostic radiology procedures (CHAM no. 683).¹⁷ In the DGF-1 the total number of unit values of diagnostic radiology tests must be listed by the hospital for the past year, and the year prior to that. In addition two columns are provided for the cost per test-unit in each year. In the HS-1 more detail is provided as far as the type of

* For 1976, both the HS-1 and the HS-2 will be revised and shortened considerably. The HS-2 will no longer contain data on so many diverse areas, but will contain mostly financial data. The HS-2 will be incorporated into the DGF-1 in 1975, the HS-1 in 1976.

Fig. 3 : Simplified Structure of the Hospital Information System.



Frequency with which information is provided:

- a = annually
- c = continuously
- q = quarterly

diagnostic radiology tests is concerned.¹⁸ The main conceptual difference between the DGF-1 and the HS-1, however, is that the DGF-1 is concerned with the unit costs of tests, and the HS-1 with the number of tests.

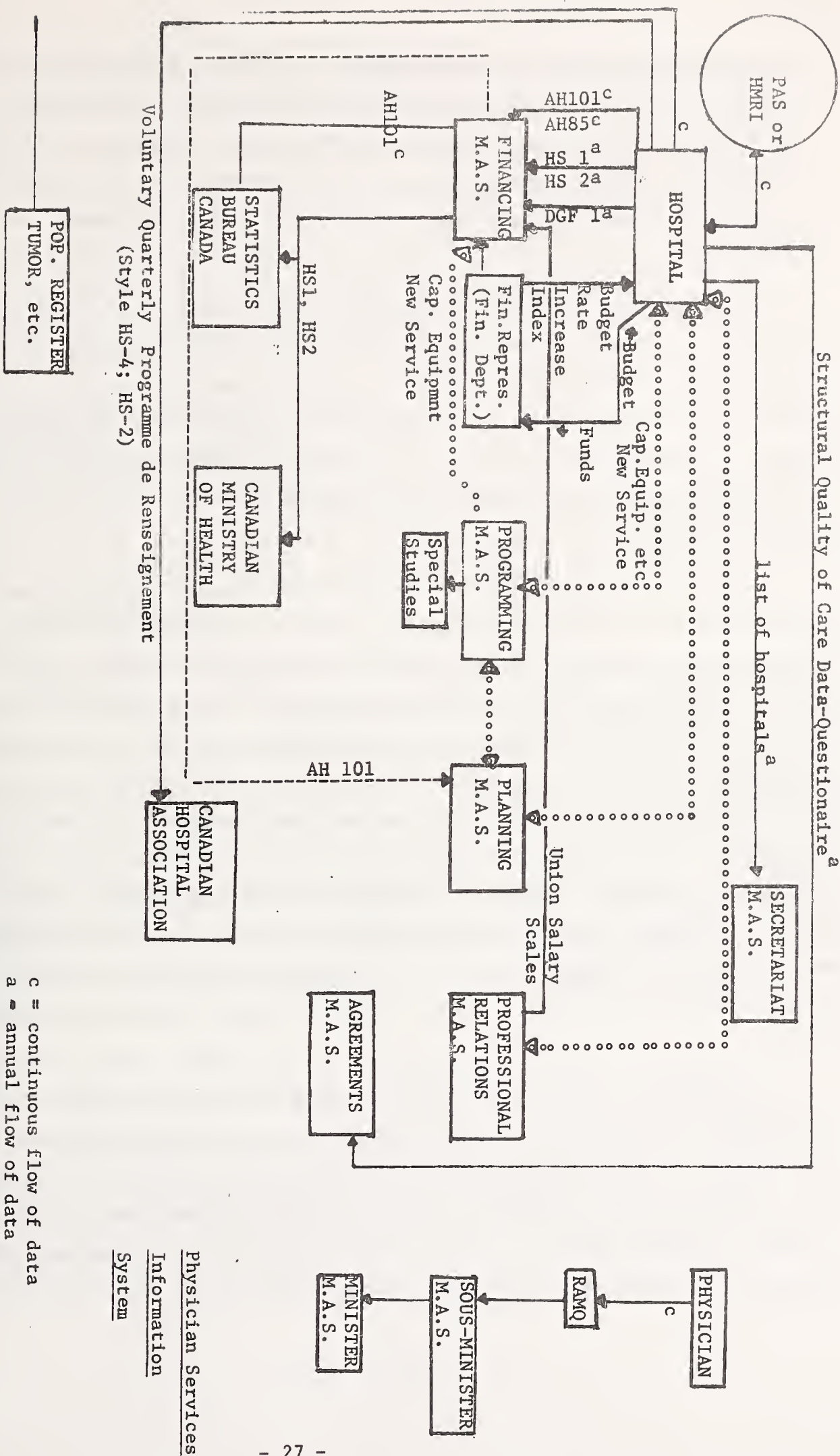
Briefly, the patient discharge summaries (AH-101 for inpatients, and AH-85 for outpatient visits) are similar to, but not as comprehensive as PAS or HMRI discharge summary forms. They permit studies of utilization per patient, for example the length of stay by hospital for specific diagnoses.

Finally, there is the questionnaire required by Agreements. In the diagram it is marked Structural Quality of Care Data-Questionnaire. The form discussed here is the one in use up to autumn of 1975, a new one is being developed. Some of the questions asked by Agreements are useful in classifying hospitals, for example what type of hospital is being licensed.¹⁹ Other information collected by this questionnaire concerns structural and process indicators of quality of care.²⁰

A host of other data is routinely collected. Some items stand out, they are information collected for the population registry, the tumor and other registries. Presently the norms and standards section of Agreements prepares some 60 forms for hospitals on which they routinely collect mostly internally utilized information, from consent forms to medical records inserts.

To generalize, then, the bulk of data required by M.A.S. is for reimbursement purposes. Examples are the budget form and the Internal Control Questionnaire, which is used as guide by the auditors to complete part of the DGF-1. Even the AH-101 and the AH-85 have financial importance. These discharge summary forms contain questions that are designed to elicit information on third party liability and subrogation of claims. This is important when patients receive services who are ineligible or who are covered elsewhere, for example patients from the United States or from Canadian provinces other than Quebec, or cases which arise from accidents. The HS-1 and HS-2 provide comparable financial and operational data for

Figure 4: Hospital Information System



all Canadian hospitals and thus permit the Federal Government to analyze and control its financial contributions to Provincial hospitals. The only major form which is not used for reimbursement purposes is the questionnaire administered by Agreement which is used strictly to determine whether a hospital's license ought to be granted, renewed, modified or revoked.

Clinical information, as distinct from financial and administrative information, is not analyzed by the Ministry. The Professional Corporation of Physicians examines the quality of the process or outcome of care, using cases selected from the discharge summaries or in response to a request. They review records in a process not unlike the Medical Audit in the United States. However, the documentation of such review is not available to M.A.S.

It is not clear to what degree this division of financial and quality information was based on a conscious decision of M.A.S. not to get involved in reviewing clinical practice, and to what degree it resulted from the political pressures by the Colleges of Physicians.²¹ It has been suggested that the advantage of separating the evaluation of clinical and administrative performance is that no one agency gains proprietary control over the hospitals. The disadvantage, on the other hand, according to observers, is that there is no financial incentive to provide accurate discharge summaries. Discharge diagnoses, for example, are frequently incorrect.²² One fact which is criticized is that clinical performance measures are not linked to the M.A.S. information system and thus the reimbursement of hospitals is not tied to the peer evaluation of quality of care.

Even though M.A.S. does not get involved in Medical Audits, it has standardized the format of Medical Records in accordance with the recommendations of the Castonguay Report.²³ M.A.S., and more specifically the Section of Norms and Standards of the Agreements Department, developed not only standard forms, but also tries to assure easy comparisons of records with detailed instructions and by illustrating the calculation and

use of simple hospital performance indicators, such as occupancy rates, bed turnover intervals, etc.²⁴ The Ministry advocates the unit record, where patients have one record from cradle to grave, and where in- and outpatient services are noted. This type of record is considered to facilitate continuity of care because at any given time the patient's total medical history is accessible. This is in contrast to medical record systems where each admission creates a separate record, or where in- and out-patient records are kept separately.

2. The Process of Information Integration

a) The Routine Flow of Information.

The routine flow of detailed information in Figure 4 is best described by analyzing the contents of the various data collection instruments, and their use by the Ministry's Departments.

1. The Prospective Budget

The budget package consists of two parts, 1) the global budget forms, and 2) the financial report, a cash flow analysis that permits the Ministry to establish what amounts it must reimburse periodically to hospitals, and an analysis of activity centers which allows for costs/ per unit projections.²⁵ The budget has two main components, allowable and non-allowable expenses; i.e. those expenditures that the M.A.S. will allow for in the operating expense budget, and those for which the hospital has other sources of income, such as from the sale of services, government grants, endowment income, donations, and M.A.S. allowances for capital expenditures.

The global budget applies to operating expenses only, as already stated. Excluded or non-allowable are the self-financed items, capital equipment, special grant research and new services. Specifically, non-allowable components which are financed by the hospital out of outside revenues, then, are cafeteria parking, data processing, prostheses, and pensions for past services.

Non-admissible items included in the separate capital and equipment budget of the hospital which is subsidized by the Government are debt service, repairs to equipment and capital assets, and new capital equipment. Separately financed expenditures are further: research, drugs for specific diseases, free dental clinics, and protected workshops.

Allowable components can be divided into those that are tied to the price index increases, and those that are not. The amounts not considered determined by overall inflationary pressures are salaries to senior staff, Community Health Programs, and Psychiatry.

The remaining items on the list of allowable components consist of operating expenses which are tied to price increases. These expenditures for supplies and wages are increased from one budget year to the next according to an index which takes account of price changes in supplies and changes due to negotiated wage settlements of unionized personnel. On the average labor costs constituted 74.2 per cent of total hospital reimbursements in 1974. The wages are negotiated by the unions representing hospital workers in so-called 'conventions'.²⁶ Approximately every three years, therefore, the Professional Relations Department of the M.A.S. negotiates salary and fringe benefit contracts with the hospital employee unions. (These negotiations exclude reimbursement of physicians who work in hospitals - they have separate negotiations).

The second component of the global budget rate increase index are supplies. Here, the Economic Studies Service of the Financing Planning Section of the Financing Department takes a number of supply items from the Canadian Industry Selling Price List, and some items from the Canadian Consumer Price Index, and weighs them according to their relative amounts purchased by a sample of institutions. The exact weights used in the construction of this index were not made public for the 1975 budget.

The Economic Studies Service then calculates the rate increase index by combining the information on wages and on supplies. This index is published by the Ministry, and hospitals apply that rate to these expense

categories which are subject to inflationary pressures. The rate increase allowed for 1975 was 6.4 per cent.

Altogether, there are six steps which the hospital must follow to calculate its budget correctly: 1) it must determine allowable and non-allowable expenses for the reference year, 2) it must determine the base to which the global rate increase is to be applied (i.e. only those items that are tied to price or wage index), 3) it then applies the percentage growth rate to that base, 4) it determines the other operating expenses that are part of the global budget, the so-called 'detailed component', 5) it must then arrive at the global budget by summing the base and the detailed component, and 6) finally the hospital calculates the total budget by adding whatever additional adjustments are left.

The second part of the budget package, the financial report, simply regroups the information from the budget forms into a format that allows the Ministry to see at a glance what amounts it must reimburse periodically to the hospital. It also shows the amounts the hospitals must transmit to the Ministry from their income from patients who demand but are not covered for private or semi-private accommodations.

Three additional items in the budget package bear mention, one is Annexe III, which provides information on the unit costs by non-allowable activity centers, estimated for the budget year. The second item is a form (Annexe IV) signed by the Hospital Administrator, certifying that all the information is provided according to the requirements of the Ministry. The last item (Annexe V) are forms which contain information which reallocates the approved budget amounts by activity centers.

The Ministry's intent in giving hospitals prospective budgets was clearly to provide the hospitals with immediate operating funds and free the administrators to concern themselves with internal management. The actual control of expenditures was expected to be carried out later in the year with the help of cost comparisons between hospitals. Limiting the increases of the global component of the budget to amounts corresponding

to general price increases was considered more in terms of an upper limit for overall Government outlays, than as a control on hospitals. There was the feeling that the system had enough slack, and thus an incentive plan was developed where hospitals could keep a portion of the budgeted amounts they did not spend, if they established a cost control objective at the start of the budget year.

Contrary to the Ministry's expectations very few hospitals took advantage of this plan. It therefore was discontinued for the 1975 budget year. According to a Financial Representative hospitals consider the prospective budget as an advance on expenses, and tend to spend above the budget limit. Some observers feel that possibly M.A.S. was too optimistic about the professionalism of hospital administrators, and particularly those in small hospitals. There have been many instances where hospital administrators do not feel at ease with the relative freedom of the global budget and are reluctant to make decisions and take on responsibility. This attitude has been explained by some to be the result of many years of stringent controls on administrators with line item budgets. The Ministry evaluated its success with prospective budgeting on the basis of the reduction in the amounts which were overspent each year, and which had to be made up with supplementary budgets, or with deficits.

2. Services and Capital Equipment - Initiation and Discontinuation

The hospital submits its requests and proposals for changes in its capital expenditures to the Department of Programming in the Ministry. That department translates the initial request into a working document, which details the necessary materials, staff, a work schedule, and a summary of expenditures. In cooperation with the Capital Expenditures Section of the Financing Department the need for the project is established and a budget is worked out. This budget takes into account not only the immediate, but also the future increases or reductions of costs of the new or discontinued service or facility. Directive 30.00.01(54) details the stages in which a capital improvement project is submitted, bids are requested from contractors, and approved by M.A.S.

New and discontinued services and capital equipment expenditures must fit into the five-year plan of the Planning Department. It is not quite clear what the formal links are between Planning, Financing, and Programming, when the hospital initiates the request for capital expenditures, and when that type of expenditure has not already been evaluated and considered in the short-term and long-term plans of Planning. Eventually it is hoped that Regional Councils may take over this function and that the establishment of new programs and services, as well as capital improvement programs will then be completely decentralized, possibly within a regional budget, allocated centrally to each region. Now Regional Councils establish the need for expenditures below \$50,000 for renovations only. The final approval rests with M.A.S.* (Directive 30.00.06(54)).

Sometimes a request by one or more hospitals will trigger an analysis of that area by Planning. On other occasions, a study is initiated by the Epidemiological Department, since that Department has the freedom to go on "fishing expeditions", and pick areas for analysis on the basis of studies from other countries, or on someone's suggestion, or because Planning feels that the payoff in a particular area will be great. The way in which the head of Planning and his staff select problem areas was initially provided by the very thorough analysis of the health care system carried out by the Castonguay Commission. Now the criteria for Planning to get involved in changing the system in any way are 1) the prevalence of the problem and its effects on health, 2) the level of direct and indirect costs (including long-term domino effects on other services), 3) the medical potential for intervening effectively, and 4) the degree to which the problem can be alleviated by changes in life style, rather than by health services. There was almost general consensus that at the point at which Planning finds itself presently it was not necessary to systematically search for areas that needed to be restructured, as there were so many programs and procedures which were clearly ineffective. Thus Planning so

* After January 1, 1975, some specific types of equipment will be financed with hospital revenues, from surcharges for private and semi-private rooms. It is hoped that this change will act as an incentive to hospitals to collect surcharges from patients.

far only rarely had to evaluate and compare, and then choose between programs that work, on the basis of sophisticated cost-effectiveness analyses. Instead, problem areas were easily recognized and priorities clear. According to most planners it is relatively easy to reduce ineffective services under these circumstances, because scientific arguments can be used, and political pressures are kept to a minimum. However, a time where the choice of programs will not be clearly dictated by scientific arguments and where therefore political decisions will have a significant bearing, is foreseen and dreaded by some planners.

3. The Budget Cycle

On or before October 1 of each year the hospitals submit the prospective budget for the following calendar year to the Financial Representatives who work in the Hospital Service of the Budget and Analysis Section of the Financing Department (see Fig.2). Each Financial Representative handles about ten hospitals. The information pertaining to the closing or opening of hospital services is checked by the Financial Representative with data from Programming. All data is analyzed, possibly leading to a revision of the budget. Simultaneously all other positions in the budget are checked; examples are items entered by the hospital under pilot and research projects, equipment renovation or new purchases, construction and reconstruction, as well as interest costs, debt service, and leasing.

Once the budget is approved and the Financial Report is verified, the hospital receives 26 periodic payments for operating expenses (see: Financing of a Hospital, 1975, Appendix III). Capital and Equipment, and other special provincially subsidized expenditures are paid either in one payment or every three months, depending on the item.

Because the budget process was simplified when M.A.S. went from line item budgets to global budgets, payments for the new calendar year can begin without delay. Year-end settlements, however, before a 1975 directive disallowed supplementary budgets, took much longer. Disallowing year-end settlements was felt to be necessary for an equitable financial

and budget policy toward all institutions.²⁷ It remains to be seen whether the new directive does result in the disappearance of year-end settlements and deficits. The larger hospitals seemed to receive a disproportionate share of these settlements, and several experts in the Ministry questioned whether this was due to the fact that they had the resources and challenges which attracted the most highly respected and skilled professionals into their fiscal departments.

Volume increases are no longer a reason for increases in budgets, but they must be absorbed within the prospective budget. The reasoning is that volume increases that are precipitated by new services and facilities already will have been budgeted for and therefore do not require additional funds. An example would be coronary care units and their effect on laboratory and X-Ray volumes.

This basic principle of the Quebec global budget, i.e. the maintenance of services both in terms of quality and quantity has been criticized by the chairman of the global budget committee of the Quebec Hospital Association, Pierre-Paul Mercier, CA, who is also the director of finance of the Montreal General Hospital. He feels that the progress of medicine and the evolution of health care is stymied when no allowances are made from year to year for changes in the quality or volume of services. He said that hospitals presently

were forced to finance such expansion through more efficient use of the existing resources. The greatest challenge for the system will be in setting up a procedure to take into account costs relating to the progress of medical and health care.²⁸

In general, however, hospital administrators are in favor of the global budget system, and feel that it is impossible to revert to the former method of hospital reimbursement.

Keeping track of expenditures and allowing comparisons during the year of actual to budgeted outlays, requires a periodic review of the internal hospital budgets. The Ministry (20.00.02 (61) CLSC,CH,CSS,CA) mandates a quarterly, and if the need arises a more frequent review of the internal budget. When the actual budget departs from the prospective one,

new allocations must be made. In addition, the hospitals are required to submit financial reports to the Ministry that detail the actual operations. The Rapport Financier des Etablissements de Sante et de Services Sociaux, or DGF-1 for short is an annual report, the DGF-56 is a cumulative quarterly report, and the DGF-55 (the releve financier periodique) must be submitted every 28 days. Capital expenditures must be reported to the Direction of Equipment on form R101A and R102A quarterly.

4. The Annual Financial Report of Institutions - the DGF-1

Toward the end of the year, the hospitals submit the DGF-1 which not only provides information on overall expenditures and revenues, but also unit costs per activity center. The "Annual Financial Report of Institutions" is a report required by Article 100 of the Health and Social Service Act (L.Q. 1971, Chpt. 48). The contents of the DGF-1 are described in Article 6.1.5 of the Regulation of the Act.

The DGF-1 is required by M.A.S. from public health and social service institutions which are financed by M.A.S. It contains uniform data on the financial situation and the operation of the institutions. The forms are quite explicit, all data conform to CHAM-accounts and all questions must be answered, so as to ensure comparability. The DGF-1 is a loosely stapled collection of thirty to thirty-five forms. It is accompanied by approximately 60 pages of explanatory text, and Cahier des definitions et explications du rapport financier annuel. The number of forms have increased only slightly over the years. What are the items included in the DGF-1? First there is a declaration of the administrator and the Board as to the accuracy of the data. Then a short written summary report by the auditor and an eleven page questionnaire directed also at the auditor. Finally, there is the Financial Report itself.

In the Auditor's report items are covered which range from the auditor's familiarity with the latest M.A.S. budget guide, to whether the auditor has suggested changes in the institution's internal control procedures after examining its books, and whether the auditor's suggestions

during his review of the institution for the preceding budget were followed. Then a checklist is provided for the auditor to assure that all reports required by M.A.S. are prepared routinely by the institution, the DGF1, the AHS-2, DGF-56, DGF-55, and the global budget. There are questions verifying the authorization for expenditures, such as purchases of equipment, bank loans, and the correct payment of the cost-of-living increases to the personnel. Then the auditor is required to respond to questions on revenues, he must ascertain whether the personnel is familiar with the eligibility requirements for patient services, and the non-covered services, how the subrogation of non-covered claims is handled, as well as other kinds of revenues. Then there is a large section on the care the hospital is exercising to assure that cafeteria expenditures are not financed by M.A.S., that laboratory work units are correctly counted, and that parking charges cover costs. There are questions on salary scales, financing and research, and the familiarity of the institution with new laws and its response to them. The final page directed at the auditor then requires a detailed response as to whether the institution is conforming to the regulations concerning the accounting practices of the budget.

The auditor is aided in filling out his part in the DGF-1 by the Internal Control Questionnaire for Institutions under the Control of the Ministry. His functions are defined in the Internal Control Questionnaire as follows (p. 2)

Internal control includes the plan of organization and all of the measures, coordinated and structured in systems within an organization to safeguard its assets, and to ensure the accuracy and reliability of its accounting and statistical data, and is thus an integral part of the global information system of the organization.

Although the questionnaire covers a wide range of subjects, the auditor has full discretion to expand the range of questioning. The Control Questionnaire covers the following: safeguard of assets, assures that all services rendered are billed, that payments are made only for goods and services received and that statistical and accounting information is timely, accurate, and reliable.

The Financial Report itself includes a summary statement of the revenues and expenses of the operating fund, an analysis of the Balance of Operating and Capital Funds, three tables on the origin and use of funds, an Operating Fund Balance Sheet, a Capital Fund Balance Sheet, and balance sheets for endowments, special purpose funds and for Trust funds.

Two pages cover comparative financial and operational data on 'allowable' activity centers. For each activity center the CHAM account number is provided, and for the past year as well as the budget year gross unit measures as well as costs have to be furnished.

Budgeted gross expenditures, actual revenues, and surplus or deficits are shown for admissible items and for the 'detailed component' of the budget. Details on balance sheet items can be found for operating funds and capital funds. Commitments and contingencies from contractual arrangements or purchase orders are analyzed. A Summary of financial information is provided for allowable activity centers on total gross direct costs, transfers, and total expenses. The hospital must further furnish detailed financial and operational data for each activity center. Then there is a summary page for non-allowable activity centers, and again detail must be provided for each center. There are statements of income and expenditures of the trust fund, and from other sources, a summary statement of admissible revenues and expenditures of the operating fund by program, and analysis of the interfund accounts between the operating and capital fund, data on the activity center Administration, and a list of payments received by the hospital from M.A.S. for the year terminated with dates and description of payment.

5. The Review of Actual Expenditures with the DGF-1

The DGF-1 is submitted to the Ministry by the hospital at the end of the year. The information on overall expenditures, revenues, and activity center unit costs is compiled and analyzed by the Economic Studies Section of the Financing Department. The analysis of activity center unit costs compares hospitals which are grouped by their number of beds and their

University affiliation. (See the section on Safeguards for Information Accuracy and Completeness for detail on the grouping of hospitals). Outliers are identified once the mode has been calculated of the unit costs of each activity center. Initially means and standard deviations were used to identify outliers, but the distribution of the data did not lend itself to the use of means. There were too many outliers, which made the parameters too wide within which hospitals were not subject to scrutiny. Mr. Marc Boucher, the head of Financial Planning of the Financing Department has been in charge of the analysis of unit costs from the inception of the global budget. He demonstrated that the distribution of data has become narrower since the comparisons of unit costs were first carried out. In many cases where it was thought initially that hospitals had to be narrowly stratified in order to allow fair comparisons, it has turned out that hospitals needed to be divided into only two or three groups in order to arrive at equitable unit cost modes. Also, while the distribution was skewed initially, with some hospitals below the mode by very small dollar amounts, and a slightly larger number of hospitals above the mode by larger dollar amounts, the distribution is now more symmetrical, and much closer to the mode. Thus, as a result of the narrower distribution, according to Mr. Boucher, fewer institutions exceed the limit of the mode plus twenty per cent, which is the cut-off point for review. However, these fewer institutions spend more money in those activity centers than the Financing Department was about to recoup in their initial reviews.

It has been proposed that eventually the Financial Representatives should not only have information on unit costs per activity center, but also on the units of services performed per patient, adjusted for the hospital's patient mix. Such review by the Financial Representatives would shift the emphasis from the analysis of the hospital's efficiency in producing a unit of service toward the question of whether the numbers of service units produced by a hospital are appropriate for the patient population it treats. Utilization data adjusted for patient mix cannot

be presently produced in a meaningful way. Lab units, for example, are not noted on the AH-101 patient discharge summary, which also has the discharge diagnosis for each patient. Further, as shall be discussed later, the AH-101 discharge diagnoses are frequently poorly coded, so that even a more global study of the relationship between the number of activity center units and the patient mix cannot at present be undertaken.

Hospital administrators feel that the grouping of hospitals is not always equitable, and that there is presently very little adjustment for differences in patient mix. Also, they question the accuracy with which some hospitals report activity center units. Until such time as the basic data can be made accurate, they are reluctant to be reimbursed according to the utilization of their facilities. One other factor causing the high ratio of tests per patients is frequently cited by administrators as an example of costs over which they have no control, that is the type of physician who has admitting privileges. Administrators feel that physicians in some specialities, and recent Medical School graduates order more tests, even when the patient mix is held constant.

The Castonguay Report, in /Appendix VIII.1 (Tome III, Part 2) describes a very interesting concept, the "normalized budget". Unit costs are modified by the size of the activity center, and the type of patients serviced, as well as the performance of other hospitals. An efficiency index could be calculated by dividing the expected (or normalized costs) by the actual costs, where 1 would be maximum efficiency. To the author's knowledge this methodology is not in use, conceivably because especially the data on the type of patients serviced is difficult to collect, even more difficult to summarize, and not easily used when there are so many diagnoses, so few hospitals, and such a large number of activity centers.

In a memorandum of June 9, 1975 Mr. Boucher requested a comparative evaluation of the modes of 1971, 1972 and 1973 for a few activity centers.

It shows the difficulty of evaluating hospitals with activity center data. The most important conclusion one must draw from this data and from other information, such as is provided by the Stanford Institutional Differences Study, is that there is no such thing as an 'efficient' and an 'inefficient' hospital. Hospitals do not perform consistently on all indicators, whether they be indicators of efficiency, as here in the Quebec System, or surgical death rates, indicating quality of care, as in the Stanford Study. This means that any programs directed at controlling or modifying hospital behavior have to rely on periodically collected and analyzed data on many performance indicators. One other requirement has been stipulated by Minister Forget of M.A.S., that is the system of controls must be dialectic, and change constantly, not only to keep up with changes in the environment, but also to keep those that are being regulated, from adapting to the system in a socially undesirable way.

6. The Annual Return of Hospitals, the HS-1 and HS-2

These two sets of forms have different purposes, while the HS-1 collects data on facilities and services, the HS-2 contains financial data. As already discussed, these forms are sent to Statistics Canada and the Canadian Ministry of Health and Welfare on an annual basis. Hospitals can also join the Programme de Renseignement Hospitaliers of the Canadian Hospital Association and Statistics Canada, a quarterly voluntary data service, which contains selected items from the HS-1 and HS-2. The Canadian Hospital association groups the hospitals for comparative purposes and provides quarterly, timely feedback to hospitals. The grouping of hospitals differs from the groups used by the Financing Department in its analysis of activity center unit costs. The data can also be compared only with the utmost care to the annual reports by Statistics Canada, because the sample includes only those hospitals which voluntarily purchase the service.

The HS-1 provides information on the type of hospital, the services it provides, its ownership and operation, the number of beds, occupancy

rates, and patient days by type of patient, the patient movement (admission, discharges, and deaths), the kinds and units of laboratory and radiology diagnostic tests and therapy done for in-patients, out-patients, staff, and other institutions, the kinds and units of tests referred outside, the type of radiology equipment, numbers and types of cases of poisoning treated, numbers and complications of obstetrical cases, autopsies, physical therapy, meals prepared, laundry units, housing for staff, care units provided by ambulatory clinics, and data on all personnel, educational programs, as well as administrative, nursing and general housekeeping services.

The HS-2 provides financial data, which is similar to the financial information provided by the DGF-1, although it is grouped differently. Operating expenses are provided for nursing, diagnostic and therapeutic services, for educational programs, administrative and support departments, and medical and surgical supplies and drugs.

All this data is compiled in a report, not unlike the AHA Guide Issue. The difference is, however, that the hospitals are grouped, so that it is impossible to abstract from this report for example the types of services provided or the occupancy rate of a specific hospital. Also, the report usually takes one or two years to prepare, possibly because of some late reporting by hospitals.

A Committee is investigating the possibility of arranging the data required by the DGF-1 in a way that makes the rearrangement of the data for the HS-1 and the HS-2 unnecessary. The final report which summarizes the information on hospital facilities and services is being used by the Service of Development of Resources in the Planning Department. That Service is working on a long-term plan of bed requirements, using experts' estimates of needs. These bed/population ratios are then compared to actual ratios, by geographical area, by short term beds (3.2 beds/1000 population is estimated need), long-term beds (2.0 beds/1000 population estimated need), and by physical, psychiatric or ultraspecialized services. When they applied this theoretical bed requirement to the actual population data, without standardizing for age, none of the health regions attained the norms.

7. Patient Discharge Summaries - AH-101 and AH-85.

The AH-101 is the inpatient discharge summary, while the AH-85 is for outpatient visits. The AH-101 resembles a Blue Cross Hospital Claim and Discharge Summary. It contains data identifying the patient: the names of the patient, his/her parents and spouse, the Medical Record and admission numbers, and whether the patient was admitted from an ambulance or police car and their registration numbers. Other data could be used for classifying the patient in epidemiological studies: sex, nationality, religion, place and date of birth, and occupation. Coverage and billing information is provided in case of third party liability. One of the major purposes of the AH-101 is the recovery of expenditures from non-covered patients, and the recovery of private room surcharges from covered patients where a private room is not medically necessary. Verifying whether a patient is indeed a Quebec resident and therefore eligible for service is difficult. Large hospitals in Montreal who treated 20,000 patients per year treated not one non-resident, according to their records. I was told by one administrator that that is unlikely. Common sense dictates the same conclusion.

Studies of the appropriateness of average and pre-operative lengths of stay could be carried out with the information on diagnosis, the type of surgical intervention, the presence of complications and secondary operations.

Regularly coded are the following items: the number of the institution, the year and number of the admission, the medical record number, the age and sex of the patient, his or her health insurance number, the accommodation requested by the patient and supplied (if the patient requests private room without medical necessity, patient will be billed for the difference between that charge and the one for a ward bed), who is responsible for payment, the data and code of the accident, if applicable, the date of admission and discharge, the length of stay by accommodation, the days of stay which were medically necessary, death, if applicable, the code numbers of the physician, the surgeon, the diagnosis, the operation and complications,

as well as the number of days billed to M.A.S., the patient, or another organization.

The latest minor change in the AH-101 was the introduction of postal codes of the patients' residences. This permitted detailed patient origin studies and the definition of a patient profile by catchment areas. Presently a complete revision of the AH-101 is being discussed at the Ministry. A possible model for the revised form is the HMRI Basic Abstract (a service provided by a non-profit organization consisting of the Ontario Associations of Hospitals, Physicians, and Record Librarians). This record emphasizes those items of information about the patient that are useful for utilization studies. It provides room for 34 secondary diagnoses, for example, for the admission and discharge status of the patient, for surgical procedures, therapy, laboratory and other test findings on admission, drugs administered, and detail on the occurrence of death where applicable. The form has no space designated for billing information, but there are optional blocks. M.A.S. probably will opt for a form that carries a minimum of information on an ongoing basis and can be expanded as the need arises. Thus, for special studies a sample of hospitals could be required to complete all blocks in the form.

Conceivably this form could serve three different purposes, one, as basis for third party and patient billing, two, for utilization studies, and three, it could be used by RAMQ to reimburse the physician and/or surgeon for medical services rendered in hospitals, and outpatient departments.

Portions of the 1.5 million AH-101 forms yearly, are coded, verified by Data Preparation and Processing in M.A.S., and then summarized by the Canadian Government's Department of Statistics and Ministry of Health. Several reports on length of stay are prepared with the AH-101. Its patient origin and utilization data is also used by Planning. The sheer amount of the data is lamented by the staff in the Ministry. In the case

of the AH-85, the amounts of data became too large and too unproductive to process, so AH-85 forms are presently not processed.

In 5.6 per cent of AH-101 forms the diagnosis is missing completely.²⁹ The AH-101 is completed in the hospital's record room, and there is little incentive to insure its accuracy, particularly the accuracy of the diagnosis. The usual problems in coding discharge diagnoses arise: what diagnosis should be coded as primary diagnosis, and which of the secondary diagnoses should be coded or which surgical procedure, if there are more than one. In addition, coding errors arise. Thus, one perceives some reluctance on the part of researchers and statisticians to use the AH-101 data without first checking the validity of the information. The AH-101 nevertheless was the basis of a 1975 study on 1972 short-stay hospitalizations (of less than two days duration) by the Economic Studies Service of the Financing Department.³⁰ The AH-101 has also been used to calculate a standardized expected average length of stay by the Research and Statistics Section of the Planning Department (Medics program). The time lag, unfortunately, between the hospitalizations and the publication of study results is usually a minimum of two years.³¹

Hospitals receive a feedback report in which their average length of stay for 48 diagnoses is compared to other hospitals.

8. Other Data

The Questionnaire administered by Agreements has already been described. As far as could be ascertained, it is not used in other M.A.S. Departments. Professional Relations requests periodic information from the hospitals for use in labor negotiations. Planning, Programming, and Financing are concerned about their lack of information on the supplies of professional and non-professional hospital personnel. Absenteeism rates in the Province are high, and temporary employees, especially in nursing, are used extensively. Predicting the caliber of the future labor pool is a necessity for projections of personnel costs. Therefore a data bank has been recommended on the availability of hospital staff

in the province, their numbers, training, and experience. This information system has been named ALPHA, and should be in operation shortly.

A detailed listing of institutions already exists, the Fichier Central of Quebec Institutions. It contains photos, plans and utilization of each floor, square feet per service (maternity, gynecology, Medicine, Surgery), and data from the HS-1. Unfortunately there is no mechanism to update this file. A much less detailed list of institutions is prepared by the Secretariat of the Ministry.

The list of Quebec Institutions, an annual compilation of all hospitals and other health and social service institutions, contains very general information. The Repertoire des Etablissements de Sante et de Services Sociaux consists of data which permits identification of the institution (code number, address, telephone number), it provides some basic characteristics of the institution (category of institution, type of care it provides, public or private status, under provincial or other jurisdiction, financed by budget or otherwise, for men and/or women, overnight or not, what type of and date of incorporation, the name and phone number of the financial representative, the license number of the institution), capacity (total licensed beds, of these short-term medical beds, etc.), the names, addresses and phone numbers of the chairman of the board, the secretary and treasurer, the general administrator, the directors of administration, professional and hospital services, of nursing and the auditor.

This information on all Quebec health and social service institutions is indexed by name, code number, category of institution, the municipality in which it is located, whether the institution operates outlying centers, and by University affiliation. The book is divided into three sections, grouping the above information by three variables, the Health Service Area, the category of institution, and the alphabetical order of the name of the institution.

The listing of hospitals in the Repertoire is similar to, but not as comprehensive as the Annual Guides to the Health Care Field published by

the American Hospital Association. Lacking are the types of facilities and services which are offered by the hospital, and the inpatient, newborn, expense and personnel data of the Guide. Information on the numbers of admissions, census, occupancy rates, births, expenses, and number of personnel are produced in a Summary report from the HS-1 and HS-2 forms by Statistics Canada. The data in that report, however, are grouped so that no one hospital can be identified.

Apart from their internal budgets hospitals also generate data for peer review committees (Conseil des Medecins et Dentistes) on pharmacology, Medicine (Medical Audit), surgery, and tissue. They also comply with the information requests from the Canadian Council of Accreditation.

Two Services of the Planning Department, the Services of Research and Statistics, and the Service of Epidemiological Studies, use the widest array of data. Particularly the epidemiological study section uses the population register, the Federal Government National Health Survey, and data from studies carried out anywhere in the World. The Statistics and Research Service, according to its 1973-74 Activity Report, has made an attempt to integrate all data into one information system, and to build a model (Medics) of the Quebec health care sector. Medics makes use of RAMQ data, of the global budget, of the AH-101, and AH-85, of the HS-1 and the HS-2. The Statistics and Research Section also has chosen a sample of beneficiaries at random which will serve as basis for a regional study of demands for care, and the effect of the consumption of care on the health status of the consumers. Medics has produced a simulation exercise where outcomes can be categorized by 73 medical services, 99 diagnoses, and 25 categories of specialists.

Planners when asked to describe how they use Medics, reply that the system has not, so far, produced many useful outputs. The reason for the differing perceptions of those responsible for Medics and for Planning is probably the different time frames that are of concern to both groups. While Medics is a complex model that must be refined and reworked

continuously until it eventually does simulate some real world conditions, and therefore is a long-term project in the nature of basic research, planning so far deals with strategies and specific facets of the system at a time - for example, Maternity care. As was stated before (pp.33,34) planners feel that sophisticated methods are presently not required to select areas for rationalization. According to them there are many problem areas, and they are so apparent that they can be spotted without a model of the total system. This is readily conceded by those responsible for Medics, although they feel that even now they are able to furnish data which is of immediate applicability. An example is the analysis of standardized hospital lengths of stay. Planning is aware of the need for an overview over the entire health system and is working on methodologies to develop priorities. Financing commented that they hoped that Medics would provide data on needs and resources, and would evaluate programs. However, they warned against "acquiring data as Noah's Ark would have been loaded", that is, indiscriminately.

9. Special Reports

Numerous special studies are carried out by the Ministry's Departments. Notable ones were on Maternity care and Services for patients with kidney failure,³² conducted by the Epidemiological Studies Service, the study of dietary departments carried out by the Operational Analysis Service of the Financing Department, and the Study of Operating Rooms prepared by the Same Service. Regardless of whether information is continuously or regularly analyzed, or whether it is the basis of a special study, the users of the information system need reasonable assurances that the data is accurate and complete. The same is true when performance indicators are used for control purposes. What are the safeguards built into the system?

10. Safeguards for Information Accuracy and Completeness

Numerous controls are built into the information systems to increase the degree of confidence those using the data can have in its accuracy and completeness, as well as its comparability across hospitals. An additional

procedure to verify data is used on occasions if the need arises. That is, spot checks may be carried out from time to time to validate one set of data that has been gathered by one agency with another set collected by a different agency or during different time periods. And then of course, there are circumstances when the best method to check the validity of a set of information is to use a sample survey.

Safeguards to assure comparability and accuracy are the following:

- 1) A uniform accounting system is required for all hospitals.
- 2) Reporting forms are very detailed, and are usually accompanied by explicit instructions. Often, the specific laws and regulations are cited by which a report is required, so that those responding to questions can check the law or regulation upon which a reporting form is based.
- 3) A number of M.A.S. and external reviewers supervise the process of reporting: internal control activities are supplemented by financial representatives and external auditors.
- 4) Special studies examine logical interfaces, and/or specific sets of data when they are to be used for research purposes.
- 5) Hospital unit costs are compared for hospitals which have been grouped to make them comparable.

The Uniform Accounting System

All hospitals use the Canadian Hospital Accounting Manual (CHAM).³³ It allows a two-way classification of expenses: 1) by the nature of the expense, and 2) by the purpose of the expenditure. Types of expenditures are listed in CHAM as the cost of employment, purchased services, physical facilities, consumable supplies, financing, and miscellaneous. This method of classifying expenditures gives the hospital some choice as to how to allocate expenses, and thus does not allow comparisons of cost per unit of output by service.

The second method of accounting for expenditures is by the purpose of the expense. This classification scheme can account for expenditures either by the department or by the responsibility center. When costs are assigned by departments or by responsibility centers, comparisons of unit costs are

again difficult if the designation of a set of activities as a 'department' or a 'responsibility center' is left up to the hospitals. For the management of the hospitals the preferred accounting method is by responsibility centers, where the costs of support functions is assigned to those activity centers that use them, and thus costs can be associated with units of output for each manager of a responsibility center. Since these responsibility centers are designated by the hospital administration, and therefore are not useful in comparing a number of hospitals, the Ministry has developed a system which uniformly assigns costs by the purpose of the expense, the so-called 'activity centers'. Uniform rules also exist for the crediting of outputs to these same activity centers. These centers correspond to 'services' of 'groups of services', and several of these activity centers often correspond to one hospital responsibility center.

The Finance Department provides an exhaustive list of these activity centers in its Budget Guide, here only those applicable to acute hospitals are presented (Table 7).

Reporting Forms

Just as this exhaustive list of activity centers is provided by the Budget Guide, reporting forms are similarly explicit. In the DGF-1, for example, CHAM numbers are provided next to the listing of activity centers. Where applicable, the law or directives are cited next to the relevant questions that the auditor or the hospital administration has to respond to in the DGF-1. This is just an example of a systematic attempt on all reporting forms to refer the respondent back to the original laws and regulations.

Usually, the instructions for filling out forms require that the respondents 1) fill out each line, and 2) fit all the data into categories that are provided by the Ministry. So as to allow for items that the respondent may not know how to categorize even after consultations with the Ministry, explanatory notes can be attached - after the item has been entered into the questionnaire. A very good example are the activity

centers. It is possible that a hospital has more or fewer activity centers than are listed by M.A.S. in the budget guide and the DGF-1. In the case of fewer activity centers, all those that are not present in the hospital have to be marked as non-existent, if a form requires information on them. Should the hospital have more activity centers than the exhaustive list of the M.A.S. provides for, then the hospital must group them to make each activity center comparable to the other hospitals by fitting all the data into activity centers as they are defined by M.A.S.

In addition to instructions on data forms, most such forms that must be filled out, are accompanied by a guide or instruction book. The example cited thus far is the Budget Guide. Another example is the very detailed book of definitions and explanations for the Annual Financial Report of Establishments. The Secretariat of the Ministry also has prepared an administrative guide book called 'normes et pratiques de gestion des établissements de sante et de services sociaux'. The guide is a loose leaf note book on administrative norms and practices. It is arranged by the organization structure of the institutions (administrative services, hotel services, and professional services), as well as by the functional structure of M.A.S., that is by the Departments of Institutional Relations, Financing, Programming, and Professional Relations. The last classification is by the category of institution, i.e. hospitals, Community Health Services, Social Services, and extended care facilities. All directives emanating from M.A.S. are classified according to this scheme and can be filed accordingly. This guide is an excellent method of updating instructions to providers in an organized manner and in a format that makes following the instructions practical and easy.

Reviewers

The data which is prepared by the hospitals is reviewed routinely, both by outside reviewers, and within the Ministry. One of these routine reviews is conducted by outside auditors. The purpose of that review is

to evaluate the internal control system of the hospital administration. M.A.S. had the option to hire auditors to do this work internally or to allow hospitals to contract with auditing companies to fulfill this function. M.A.S. decided on the second alternative. In order to have some standardizing effect on the audits, however, an internal control questionnaire was prepared by the Ministry in conjunction with the firm of chartered accountants of Touche, Ross and Co. The first such internal control questionnaire was published on December 15, 1972, and like all other forms it has been updated regularly since. The auditors "examine the hospital's internal control mechanism to assure the reliability and accuracy of its accounting and statistical data". They check and evaluate the methods used by the hospitals to gather the budget information, and the consistency in complying with the Government's definitions. The definitions generally follow the Canadian Hospital Accounting Manual, as already mentioned.

Within the Ministry the data is examined for accuracy. Frequency distributions are prepared by the Financing Department of the unit costs by activity center. This process permits the Financing Department to identify outliers, and gives the financial representatives indications of what items may need reviewing for accuracy.

Special Studies

From time to time data is compared over several years to safeguard that the same definitions are being used in categorizing hospital information. In addition, data may be checked at logical interfaces between several data banks. An example is a comparison of hospital record data with the hospital's report to the patient of the services he or she received. Another possible comparison is between the hospital's report to the Ministry in Ottawa and to the Ministry in Quebec. An example of such a comparison is the review of the number of cholecystectomies reported by the hospital on the hospital discharge summary form (the AH-101) to M.A.S., and the number of cholecystectomies for which surgeons submitted claims to RAMQ. From that comparison it could be concluded that claims for

Table 5: Grouping of Hospitals for Activity Center Cost Comparisons

Group	Affiliation	No. of beds
11	University	300
12	University	299
13	Non-University	200
14	Non-University	125-199
15	Non-University	50-124
16	Non-University	49

Source: M.A.S., Financial Planning, "Donnees Financieres et
Operationelles, Rapport financier annuel, 1974-1974/75.

reimbursement were submitted to RAMQ not only by the surgeon but also by his assistants and anesthetist, and that the AH-101 was not always complete.

Comparability of Hospital Activity Center Cost Data

In order to be able to compare hospital unit costs by activity center, a grouping of hospitals was necessary, as already discussed on pp. 39,40. Short-term hospitals were grouped by the number of beds, and whether they are University-affiliated or not. There are six groups (Table 5).

As already discussed, modes are calculated for the unit costs of activity centers. These allow grouping of hospitals, depending on the activity center for comparative purposes. (See Table 6) The grouping has been revised several times. While it seemed initially that many different groupings would be required for many activity centers, after several years of experience with the reporting forms hospital unit costs by activity center now have a much narrower distribution than they used to. The head of the Economic Studies Section of Financial Planning believes that this is mainly due to the efforts of the Financial Representatives and the Financial Planning Department in checking each outlying item for accuracy of the reporting method. The list of activity centers and their unit measures are shown in Table 7.

Comparability of Data Not Collected by M.A.S.

As already mentioned, M.A.S. went to great lengths to standardize all records in the Medical Record Departments. Although one major reason was to improve the quality and continuity of care, another one was to assure that quality of care review by professional organizations, presently by the Colleges of Physicians, would be facilitated. Diagnoses are uniformly coded according to the ICDA-8.

b) The Evolution of Objectives in Financing, Planning, and Information Systems

The routine flow of information used for operational purposes emphasizes budget and cost data. At the same time a sophisticated

Activity Centers (DGF-1 1973 - 1973/74)

Activity Center	Hospital Groups						One Group only
	11	12	13	14	15	16	
600	01	01	02	02	03	03	
605	01	01	02	02	02	03	
610	01	01	02	02	02	03	
611							x
614							x
615							x
616							x
617							x
619	01	-	-	-	-	-	
620							x
623							x
626	01	01	02	02	02	02	
630							x
632	01	01	02	02	03	04	
637	01	01	01	01	01	-	
638							x
641							x
644							x
658							x
659							x
660							x
676							x
677							x
678							x
679							x
680							x
683							x
687							x
688							x
691							x
720							x
730							x
733							x
740							x
750							x
751							x
755							x
760							x
764							x
770							x
771							x
780							x

Source: Analyse des Donnees Financieres et Operationnelles des Centres d'Activite admissibles et non-admissibles, DGF-1, 1973-73/74.
Table des Facteurs de Groupage, 21/10/74.

Table 7 : Activity Centers for Acute Hospitals

No	Activity Center	Unit Measures
600	Administration of Nursing Services	Hours paid for activ.c.605 and 626
605	Nursing Services - acute illnesses	Number of discharges for the year
610	Day nursing - child psychiatry	Days of presence per year
611	Day nursing - adults psychiatry	Days of presence per year
612	Nursing - acute psychiatric cases	Number of discharges for the year
613	Nursing - long-term psych. cases	patient days
614	Nursing - long-term tuberculosis	patient days
615	Nursing - long-term gnl. cases	patient days
617	Home nursing care	treatment units
620	Nursery	newborn (weighted by 3 for pre-mature = less th.2500g)
623	Delivery rooms	Deliveries
626	Operating Rooms	hours of intervention
630	Ambulatory service	-
632	Central Supply	number of admissions
637	Educational Service	Patient days
638	Alcoholism and Toxicomania	number of encounters
641	Medical psychiatric service	number of encounters
654	Dental Service	relative unit value
658	Preventive Service (D.S.C.)	number of encounters
659	School health service	children registered in schools
660	Laboratories	technical units
676	Eletrocardiography	exams
677	Electroencephalography	exams
678	Radio-isotope service	professional units
679	Hemodialysis	treatments
680	Pharmacy	patient days or days of presence
683	Diagnostic Radiology	professional units
684	Therapeutic radiology	professional units
687	Physiotherapy	weighted units
688	Ergotherapy	weighted units
689	Occupational Therapy	patient or presence days
691	Social Services	active files/period
692	Psychology Services	active files/period
720	Instruction	student weeks per year
730	Gnl. administration	hours paid,divided by 1000
733	Admin. of D.S.C.(Comm.health dept)	paid hours
740	Transport of patients	patients transported
750	Medical Records	admissions
751	Medical Library	number of consultations
755	Dietary	patient days
760	Laundry	patient days
764	Housekeeping	100 square feet
770	Plant Operation	1000 cubic feet
771	security	100 square feet
780	Plant Maintenance	1000 cubic feet

Source: Dpt. of Financing, 1975 Budget Guide, pp. 85 - 107.

integrated information system is being developed, Medics, which will allow modeling and simulation exercises of events in the health care system. The nature of the output of Medics lends itself to long-term planning and forecasts, its purpose is not to provide operational data or to facilitate the ongoing communication between the Ministry and the institutions. Medics, because of the complexity of the health care sector, cannot contain detail on every event, because overwhelming amounts of data would result. It will therefore be used very selectively, and intermittently as a tool for planning and evaluation.

Although the Ministry has thus made a conscious effort to establish information systems that are cost/effective, to separate short-term and long-term information systems, and to collect and analyze data only as needed, the development of the Medics model has been quite expensive and it is still not quite complete. Very little information and analysis has been generated from Medica for its principal consumer, the Planning Department. One might question on the basis of direct benefits whether Medics is cost-effective, particularly in a small (6 Million beneficiaries) system like Quebec. On the other hand the development of Medics has attracted professionals who have been available to consult on other aspects of the information system. Therefore the overall costs of Medics may be balanced by its direct and indirect benefits. The Deputy Minister, Dr. Brunet, feels that it was a worthwhile project of gathering basic data and of sharpening tools of analysis.

As already discussed, the operational information system is presently heavily weighed toward financial data. The observer is struck by the fact that there is little triaging of information within the Ministry, except where financial data is concerned. Data on utilization and production costs, long-term plans for Capital equipment purchases, and quality of care flow directly from the hospital to the principal user of the data in M.A.S. Such a system of communication provides the hospital with immediate access to each M.A.S. department. However, it precipitates duplication of effort on the part of the hospital, for

example it will have to fill out numerous forms on which it is requested to provide its number of beds. Within M.A.S. this decentralized communication system means complex routing of data is required for the integration of data systems.

The outside observer cannot help but be impressed by the high degree of organization in the collection and distribution of financial data, and be surprised by the almost complete absence on a continuous basis of data integration between costs, utilization, and quality of care. This is in stark contrast to the Castonguay Report's analysis of the information requirements of the Quebec health care system. The emphasis of the Castonguay Report recommendations was on access and on the equitable distribution of effective care. In its report the Commission was very concerned with information which would indicate whether the health care provided was in fact appropriate and effective. Thus, the Commission recommended that health status indicators be compiled, which would provide a benchmark for evaluating the effect of care on the 'health' of the population. This concern is evident in the health sector information considered necessary by the Commission. (Table 8) Even the measures which were designed to evaluate the performance of the new health care delivery system are often indicators of the effectiveness of care. Examples are the accuracy of diagnoses, the appropriateness of therapy, and the duration of stay at an institution for a given disease. Much less attention was paid by the Commission members to the financial performance measures which are now so prevalent. One senses a preoccupation on the Commission's part with the accessibility of care, and silent concurrence with Archibald Cochrane's dictum "All effective care should be free".³⁴ There is virtually no discussion of the possibility that even among effective care choices might have to be made at some point between programs or among patients.

After the Commission returned its report, and the M.A.S. was established, immediate needs and short-term objectives of M.A.S. required a corresponding information system. From the Castonguay Report we know that the financing

1. THE PEOPLE'S STATE OF HEALTH

Demographic and Socio-economic characteristics of the people; incidence and prevalence of disease and accidents; the quantitative and qualitative importance of disabilities; general mortality by categories of disease.

(By region, Community Health Center zone, or for Quebec as a whole)

2. FUNCTIONING OF THE SYSTEM

1. General Characteristics of Institutions

Legal Status and property; accreditation and affiliation with a view toward distribution of care and to teaching; relations with other institutions based on care levels (general, specialized and highly specialized) and with other institutions of learning, welfare, etc.; dimension, sites, facilities; economic value and depreciation;

2. Administration

Board of Directors: composition and activity; administrators: qualities and credentials and status in the institutions.

3. Staff

Number, qualifications; socio-demographic characteristics; working hours, salaries; replacement rates; volume of work (example: number of patients, visits, care given); relations among categories of staff in each institution.

4. Care Organization

Types and organization of services and of units; number of hours of operation of distribution units; detection of diseases based on characteristics of people and categories of diagnosis: routine, specific, supervisory measures; diagnosis activity: types of methods by categories of patients, examinations per population unit, methods of validating diagnoses; treatment (taking into account the evolutive stage of diseases); preventive and curative care, rehabilitative care; use of medication according to types of medication and categories of disease, as well as by population unit; utilization of different surgical methods and special techniques of treatment such as dietetics, physiotherapy, occupational therapy, etc; number of persons treated at the different care units, number and duration of episodes of care, consultations.

3. OUTPUT OF THE PLAN

Mortality, morbidity and disability rates; incidence of certain diseases and complications which may be prevented; evolutive stage of diseases at the time of diagnosis; survival rate starting with diagnosis; perinatal mortality and infant mortality rates; maternal mortality and morbidity.

system was considered unsatisfactory, and one of the root causes of the inflationary cost increases in the hospital sector. The line-item budget gave administrators no responsibility, rigidly controlling operating expenditures. Reimbursement for current expenditures was partially based on occupancy rates, so that administrators had ample incentive to maximize bed occupancy. Some hospitals with shorter lengths of stay were actually penalized, if that meant somewhat higher per diem costs and somewhat lower occupancy rates. However, while operating costs were rigidly controlled, capital expenditures were under less supervision. Even though the Government refused, in principle, to cover overspending of the line item budgets, it eventually did wind up paying indirectly when hospitals obtained loans. The Government paid directly for 50 per cent of the non-approved expenditures, and that amount constituted 10 per cent of all approved expenditures, so that on December 31, 1967 the accumulated deficit had reached \$90 million. The Castonguay Commission surmised that a large portion of this deficit was caused by the negative incentives that hospitals were operating under, their lack of administrative freedom, and the fact that they had to return unused funds to the Government. The Commission also felt that the wrong methods of control had been applied, such as the control of unit costs without allowing for the size and type of the hospital, and cutting all hospital budgets by uniform percentages. To quote the report, "The control mechanism" was "incapable of detecting, let alone encouraging efficiency in hospitals".³⁵ As the Commission recommended a complete change in the reimbursement mechanism, the prospective global budget, and as it discussed the 'normalized budget' as a control mechanism, the new information system was pragmatically directed toward financing and cost control. Carrying out its short-term objectives the M.A.S. based its actions on financial data. The main problem was to preserve the hospitals' liquidity and all information was geared toward that goal. To the uninitiated the information flow was reminiscent of Blue Cross and batch processing of claims or budgets. The emphasis was on verifying expenditures, and on comparing unit costs. There was little or no

concern with whether the units of services were appropriate. It seems that the M.A.S. departments are currently getting to that stage. The discussion of using the AH-101 as a utilization indicator, and of making the form more useful and accurate is a sign that it will be used in conjunction with cost data. Not just utilization or demand is being scrutinized, but also supply. ALPHA is an example of an attempt to systematically collect data on resources, in this care personnel.

One can foresee that soon M.A.S. will question the trade-offs between various programs, because of its concern with ever growing expenditures. Not in the offing, at present, is an integration of peer review data on quality of care. M.A.S. is not too concerned about the quality of care, as the experts feel that there is enough financial slack in the system, so that trade offs need not be made presently between quality and costs. Also M.A.S. expects consumers and providers to protest if the quality of care should decrease. There are no plans to integrate quality data with costs and utilization data and to adjust reimbursement to the levels of quality of care provided.

The information system has adapted to changing objectives seemingly naturally and unplanned. That, however, is hardly the case. In February of 1973 the then Assistant Deputy Minister of Finance (now Minister of Social Affairs), Claude Forget outlined his objectives in a discussion with a group of professionals from Harvard, Laval, McGill, and Sherbrooke Universities. He felt that the eventual goal of the Ministry was to define a 'social optimum' of hospital expenditures through the rational or analytical planning approach. That is, he hoped to eventually base the provision of hospital services on need, costs and benefits of hospital care, as contrasted with costs and benefits of expenditures on other types of health care, or even other goods and services provided by the Government.

In order to arrive eventually at such an approach Claude Forget felt that initially the overall short-term strategic goal of his department was to be the control of costs. An immediate consideration, however, was

to finance current operations. He saw this as a dialectical process where an ideal system would be developed gradually, and where the tactical objectives were being changed. A static system in the Ministry's view would permit the institutions to manipulate the payment mechanism. Since there is no neutral financing mechanism, such an approach would allow to counterbalance those aspects of the method of financing which provided an incentive to hospitals to behave in a manner which was not in agreement with the social benefit. In order to finance current operations, while taking some control of overall expenditures the Department of Financing backed its financial programs with an information system. The acceleration of year-end settlements was promoted, so as to allow the government to proceed from post-audit to real time monitoring of systems. Uniform accountability rules were instituted. Auditing standards were developed and detailed in internal control questionnaires. External auditors perform the audits. The overall system liquidity was restored by periodic payments of parts of the global budget to the hospitals. The maturity of accounts payable to suppliers was reduced also by the Financing Department, so as to not allow hospital administrators an additional financial margin over and above the global budget. Requiring authorization for expenditures which required bank loans was another method of closing of alternate sources of funds.

Now that the initial phase of the reorganization of hospital financing is completed, the Ministry can discuss the appropriateness of utilization at the same time as it investigates unit costs. The next item, according to the Minister then will be to evaluate hospital costs and services within the health care system and against alternative services which contribute to better health.

The routine information system then did conform to many of the criteria that the Castonguay Commission had established. The decentralization of information flows took place, and the expectation was fulfilled that such decentralization would reduce the amount of information that needed routing through the entire system.³⁶ The criteria of quality

information, pertinence, validity, accuracy, continuity, accessibility, efficiency, and functionality have been achieved to varying degrees.

The example of non-pertinent data in the report, the number of hours remunerated, rather than information on the quality of nursing personnel, is only now being phased out. The attempts at verification of data and of continuity of definitions and terminology have already been discussed. The requirement that data be efficient, i.e. not routed indiscriminately but at someone who needs it, is probably less often violated than the recommendation that the information be functional, and that superfluous elements be eliminated.

As already pointed out, the information system is still developing and has by no means achieved the final objectives that the Commission or M.A.S. had set: 1) In planning and analysis of the health plan the information system was to allow the analysis of the overall quality and output of the health plan and to define relationships between health, socio-economic-cultural variants, and environment on one hand, and the use of care on the other. In 2) quality control the Commission envisioned Medical Audit Protocols, where the ideal path of the patient for each type of ailment was to be established. 3) Financial data was to be linked with costs and utilization of services.

c) Ad hoc Data Requirements - Case

Thus far the response of the information system to routine data requirements was discussed. In many cases, analyses are required to solve a one-time problem. Such studies may cover an activity center in hospitals that shows wide variability. Examples for such work were cited earlier in the studies of laboratories, and operating rooms, carried out by the Financing Department. Another category could be described as epidemiological studies, examples of these are the review of maternity care, of kidney dialysis and of open heart surgery. These studies fall in the domain of Planning, and if they result in a decision to implement changes, Programming and Financing would also get involved.

Let us review the decision process of the closing of a 100 bed obstetrical and gynecological hospital in Montreal, the Misericorde Hospital. Misericorde performed 1500 gynecological operations per year in 2 operating rooms and had 3000 deliveries per year in 4 delivery rooms. Apart from these two major functions it was also called upon for teaching, research, and outside consultations. The decision to close the hospital was reached with information general to all maternity hospitals, and with data specific to Misericorde. In general, the birth rate was declining, the Quebec perinatal and maternal mortality rate was high, and a study by a Perinatal Committee resulted in the finding that hospitals with fewer than 1000 deliveries per year had higher perinatal mortality rates. (The area was chosen for study by the Epidemiological Studies Section of the Financing Department because of the high perinatal rates.) The study resulted in a policy espoused by the Government³⁷ that deliveries should only take place in hospitals with more than 3000 and less than 5000 deliveries. Another expert recommended providing care either in conjunction with internal medicine, or for children at risk, with pediatric departments.³⁸ Once this general policy had been formulated, the question remained, which hospitals ought to be closed. Additional data was collected for all borderline hospitals, one of them Misericorde. Financial data was requested from Programming and from the hospital detailing the capital expenditures which would be necessary to bring Misericorde up to the latest standards. The physical plant was evaluated by experts, who provided estimates of costs to bring the plant up to standards. Three alternatives were costed, 1) to provide the present services at Misericorde, 2) to provide them at another hospital, and 3) to split maternity and gynecological services between two hospitals, other than Misericorde.

This data was submitted to a Committee which was composed of hospital and Government representatives and experts. They first estimated the need for beds, and then decided on criteria on which they would base their decision which hospital to close. These criteria were the

quality of care provided, the cost, the accessibility, and the contribution of the hospital to professional education and research. Quality data was obtained from the AH-101 and consisted of the number of deliveries without and with complications. The number of complications at Misericorde were relatively low. The cost of renovation of Misericorde was estimated to be higher than the marginal cost of treating Misericorde patients at another hospital. Contractor's proposals and expert estimates provided that information. The cost per unit of service at Misericorde was very low, and so was the cost per delivery. However, the decision to close Misericorde could not be based on average cost, but had to be based on the marginal or incremental cost which would arise, if Misericorde was to be renovated, and the marginal cost of sending Misericorde patients to another hospital.

The accessibility of the hospital was ascertained from the geographical origin study carried out with AH-101 data. The Contribution of Misericorde to professional education and research was evaluated by experts.

After all these factors had been weighed for all freestanding maternity hospitals which were originally studied, the decision was reached to close Misericorde. Experts recommended that a small study be undertaken to find an appropriate use for the hospital. The cost of leveling the hospital was evaluated against the cost of transforming it into a long-term care unit.

The experience with the files from Misericorde Hospital provide a clue why the system seems to be working adequately. Quebec is a relatively close knit Province of 6 Million French-speaking Canadians (of whom 80 percent speak French only), surrounded by English-speaking Canada. The professionals know one another, and much information is passed informally. The personnel in the Ministry and in the institutions is generally of high caliber. Quebec produces disproportionate numbers of physicians compared to its population, and therefore possibly has room in the educational system for disproportionate numbers of experts in health care administration, statistics, economics, and all the other fields that are concerned with the operation of the health care delivery system. Perhaps because of their

identification with their French Canadian ethnic background the mobility of professionals outside the Province is lower than in comparable situations in the US. These interpersonal relationships naturally affect the communication between Departments in the Ministry and with the hospitals. Thus, apart from a highly structured information system, many informal channels of information exist. This is particularly evident in the Financing Department which has several employees who worked under the old system of line item reimbursements. Naturally, these employees have a wealth of information, which contributes substantially to the informal communication network. Such an informal network, however, can also have negative side-effects, because committees of experts may sometimes be influenced by value judgment and thus interpret data accordingly. At least one source felt that the closing of maternity wards had been based more on value judgment than on findings that could be documented, and that the available data had been possibly misinterpreted. Another problem in obtaining expert advice in a small scientific community could be that it becomes inbred. Apart from these problems in working with expert committees, obstacles exist elsewhere to the effective use of data.

d) Obstacles to the Effective Use of Data

There are three major obstacles which impede the effective use of information in M.A.S., 1) bureaucratic obstacles stemming from historical convention, and creating personnel problems, 2) political, and 3) technical obstacles.

The most obvious obstacle to data integration and effective use was the necessity, when the M.A.S. was first established, to go on with business as usual. There was no one point in time at which the total system could be revamped. Thus the Ministry decided to make the best of a given situation, and to make changes in the information system gradually, while at the same time continuing to pay hospitals and monitoring

their output. There simply was a reluctance on the part of the Ministry to merge the data generated by RAMQ on the use of physician services and the hospital cost data. Various sources now deplore that lack of linkages between medical and hospital services, and therefore would like to see the expansion of the AH-101 forms. History may also play a role in personnel practices. For the Ministry new employees are trained on the job, and receive instruction in very limited areas. It generally takes about two years, before a new employee of the Financing Department, for example, understands and knows all the work that is being performed in the Department. This training method can strike the observer as a holdover of the old Blue Cross batch processing of claims. In claims processing each employee only performs a small task, for which he is trained in a short period of time. Should the employee leave, he or she can be easily replaced. This process results in high turnover rate of personnel with little educational background who are poorly paid. Now, when the Ministry attracts very highly qualified professional staffs, the training process may not lead to the optimal output. Another bureaucratic obstacle may stymie the hiring or retention of exceptional personnel, and thus lead to higher turnover rates, which affect the communication network. Promotions are given on the basis of the number of subordinates a staff member supervises. Only recently has this problem been recognized, and staff positions been created which do not require administrative skills in addition to professional skills for promotion.

In the hospitals administrators in the past were not used to taking the initiative in allocating their budget, since they were rigidly limited by line item budgets. Thus, some observers feel that some administrators now tend to be poorly prepared to deal with their sizeable budgets and responsibility.

Obstacles to effective use of data which stem from essentially bureaucratic procedures exist not only within the Ministry and the hospitals, but also in the communication between the Ministry and the

hospitals. It has been suggested that feedback from M.A.S. is insufficient and ineffective, because 1) the personnel that are charged with most of that feedback, the Financial Representatives, are inadequately trained and are powerless within the Ministry, and 2), because much of the feedback, for example the HS-1 and HS-2 summaries, are provided with a long time lag.

The problem of who the Financial Representative is accountable to, and whose interests he or she represents is only one reason for the hospitals' malaise with the communications network. The other one is that they feel that Financial Representatives in general are poorly trained (there is much on-the-job training, they say), and that the relatively low salaries paid to Financial Representatives (when compared to incomes of other auditors and accountants) attracts only the marginal auditors and accountants. These then are felt to be poor representatives of the hospitals' concerns.

There is also a very general complaint about the overall quantity of feedback, not just about the lack of status of those providing it. If a hospital's unit costs for activity centers are above the norms, then it would be in very minimal contact even with its Financial Representative. Especially hospitals performing well would like to see more personal communications from M.A.S., as well as more information feedback.

Political obstacles arise in attempts to utilize quality of care data from hospital records and medical service data from RAMQ for quality reviews. Another problem is the duplication of information on Provincial and Federal forms with different definitions. The Provincial Government is unlikely to give up the DGF-1, for example, and the Federal Government is also unlikely to expand its forms for the French-speaking Province alone. As far as simplifying the data collection process within hospitals administrators wholeheartedly welcome such efforts. However, those presently dealing with the financial management of hospitals would lose

some power, as the maze of forms does make administrators in charge of Financing into specialists. Conceivably not many members of hospital staffs understand the various methods of data presentation. This is another obstacle to the effective use of data, as presently there is little incentive for the staff to provide accurate information, when the objectives of the collection of data are not always clearcut, or understood by the staff.

The third obstacle is of a technical nature. One is often told that if only the information existed, health care delivery systems could respond to changing needs of consumers and providers. Effective care could be provided in the most efficient manner, alternative production methods could be costed out, and the effect of the consumption of care on the health of the consumer could be evaluated. In theory, then, the Province of Quebec should be able to reimburse hospitals and reward them for efficiency in production and utilization and for a high proportion of patients whose health was improved by the hospital stay. There are several reasons, why this state of the art has not been achieved. The most important one, is that there are so many diagnoses, and so many factors determining the outcome of therapy, that predicting outcomes is not always easy when one uses global information, and not clinical judgment in record reviews. Such data integration is extremely costly on an ongoing basis and often not possible with present methodologies and technology.

Even grouping hospitals for activity centers is not without controversy. Three hospitals were interviewed on the fairness and equity of their assignment to one or the other group of hospitals for comparisons of unit costs. All three were general hospitals with various levels of services and facilities, and with different numbers of beds. None of the three thought that it had been compared to hospitals which served the same patient mix, and therefore all three protested the calculated expected unit costs. As already pointed out, it is rare that one hospital will be consistently more efficient on all unit costs than other hospitals, so

that there will be virtually no hospital that has never had a higher unit cost than the hospitals it is compared to.

These same complaints are voiced when hospital performance measures, such as death rates, occupancy rates, and length of stay are compared. For comparisons of units of laboratory tests performed per patients, some administrators feel that not only should the condition of the patient and the teaching status of the hospital be mitigating factors, but also the type of specialties and medical education of the hospital's attending physicians. No one even discusses the technical problems that would be associated with tying reimbursement to quality of care levels. There are selective measures only that can be taken to link reimbursement for a service to the quality provided. An example is the Quebec drug list, which provides the physician with a list of drugs which will be covered for specific groups of beneficiaries. The drugs were chosen on the basis of their efficacy. This approach could also be used to discourage surgical procedures which have doubtful clinical effectiveness.

Regardless of whether information is not used effectively because of bureaucratic obstacles, or political or technical ones, the sheer amount of data and the intricacy of the information systems can be overwhelming. This is important for the routine collection of data, but it does become a stumbling block at times when special studies are undertaken. Such a situation existed when three different departments decided to investigate renal transplants and kidney dialysis. The decentralization of the data collection process lead to almost complete triplication of effort. Epidemiology had decided to estimate probable volumes of either procedure, and to evaluate ongoing programs. A report had already been circulated by Epidemiology to several people for comments when the staff person in charge found out that Agreements had done similar work, because that Department wanted to close some transplant centers because of lack of patients. At that point an employee of Financing contacted Epidemiology, having heard from a physician in a hospital that he had just discussed

kidney dialysis and renal transplants with another member of M.A.S. Financing did a cost comparison study between home and hospital dialysis and needed a volume projection.

Future Developments in Hospital Information Systems

The Ministry of Social Affairs of the Province of Quebec has established a sophisticated information system, consisting of many information streams which are integrated as the need arises. The system is still evolving and various Ministry Committees are working on areas within the information system. One such area which was already discussed is the revision of the AH-101. Another project is concerned with streamlining the entire Financing Department information flow and revising activity center performance measures. A Standing Committee on Information Systems is engaged in further integration of the system. Finally, the old Medical Research Council was expanded and renamed the Conseil de la Recherche en Sante du Quebec. The Council with the budget of the old Medical Research Council, plus 2/10th of one percent of the reimbursements of RAMQ to all health professionals, makes research grants for basic and clinical studies, for epidemiological studies, applied research, and randomized clinical trials, to supplement the Ministry's analytical capabilities. In the future physician's profiles will also be produced probably from AH-101 data.

Many of these future endeavors have been generated because problems were perceived in the integration of the system. Thus the Ministry would like to expand the emphasis of the information system. So far overall cost data has been the main concern of the information system experts, because that information is required for financing of hospitals.

The Ministry has determined that these cost comparisons need to be refined to make them even more equitable. In addition, however, it has become apparent that an efficient hospital may have a higher than average

unit cost for an activity center, because cost comparisons without regard to patient mix do not inform about appropriate utilization patterns. Thus in addition to cost comparisons, the appropriateness of utilization must be determined. Initially this will be done by comparing hospitals on the basis of patient mix, teaching status, and many other factors that affect unit costs, and are not controllable by the hospital administrator. The observed utilization of all hospitals will be the initial standard.

Future work will have to concern itself less with these relative standards, and will be committed to the development of absolute outcome criteria of the effects of consumption of care on health. These plans are the basis for the present discussions about creating the Research Council, and for the freedom given to the Epidemiological Service to formulate its own priorities for research. Eventually further methodological and technical advances can be foreseen which will permit the analysis and selection between governmentally sponsored programs on the basis of their effects on the health of the population and on the basis of their cost to society.

Chapter II: References and Notes

17. Financing Department, Ministry of Financial Affairs, The Annual Financial Report of Establishments, DGF-1, 1973, p 14.
18. They are divided into seven categories: 1) TB screening chest X-ray; 2) all other chest X-rays; 3) fluoroscopic exams with or without film; 4) ceneradiographic examinations; 5) other X-ray film examinations, except chest X-rays; 6) tests which may or may not be done by the Radiology Department, such as EKG, EEG, BMR, Echograms, and diagnostic nuclear medicine; and 7) other radiology tests not so far mentioned.

These types of tests are then further stratified by the type of patient who received the service: inpatients, outpatients, and routine examinations of staff. Finally, these examinations are totalled. One additional breakdown is provided for this total number of tests in a column each for those tests performed by the hospital, and those done by outside agencies.
19. The hospitals are stratified by the type of patient they treat: general, specialized, ultra-specialized, short-term or long-term patients. Other factors used in the quality evaluation of the hospitals is the bed capacity, and whether the hospital is accredited by the Canadian Counseil d'Agreement des Hopitaux.
20. An example of a question eliciting information about structural indicators of quality of care is on page 15 of the Questionnaire: "Does your hospital have the following services: a pharmacy, an admitting office, a medical records library. . ." Process is evaluated, for instance, by the response to the following question: "Does the renewal of an order mean that a new order must be given?" (p. 11, 3.6.4).
21. In a brief to the Commission of April 1967, the Quebec College of Physicians and Surgeons stated:

"The College wishes to retain full responsibility for control of the medical service, wherever it may be provided. Pertinent changes will be proposed in our draft Bill so as to assure the College all the authority necessary to exercise this control in hospital as well as in the doctor's office."
22. This point of incorrect discharge diagnoses, and accuracy of data will be further elaborated in the section on accuracy of data, page 54. See also page 45, "5.6 per cent of the AH-101 forms" did not have a discharge diagnosis listed at all.

23. The Medical Records standarization was dealt with in the Castonguay Report, Volume IV, Tome III, Part 2, p. 107 ff.
24. M.A.S., Standards for Medical Records for Hospitals, (Quebec, 1974).
The list of performance indicators provided by Agreements reads as follows: Gross percentage of deaths, net percentage of deaths, percentage of post-operative deaths, percentage of maternal deaths, percentage of new-born deaths, percentage of stillbirths, neonatal deaths per 1000 live births, perinatal deaths per 1000 viable births, percentage of anesthetic deaths, gross percentage of autopsies, percentage of in-patients seen in consultation, percentage of consultations given, percentage of caesarian sections, percentage of hospital infections, percentage of post-operative infections, average length of stay, average length of stay for newborns, average number of patients per day, average number of newborns per day, percentage of occupancy, percentage of occupancy of newborns, percentage of normal histopathology specimens.
Registers which must be kept at the Medical Records Department are: a register of admissions and discharges; a register of the medical record number first assigned to a patient; a register of deaths, and births.
25. See the list of activity centers provided in the section on Safeguards for Information Accuracy and Completeness. See also Appendix II: Constructing a Hospital Budget.
26. The strike of nurses in Quebec at the beginning of October 1975 was the result of the lack of agreement in such a negotiation.
27. Directive 20.00.07 (61) CH, of August 1st, 1974 for 1975/76.
28. John Shaugnessy, Quebec's global budget system entrenched - working well, The Medical Post, August 29, 1975.
29. Medics: 74-001, Activity Report 1973-1974 (Quebec: M.A.S. 1974).
30. Jacques Lefort, Hospitalization de Courte Duree, 1972 (Quebec: M.A.S. 1975).
31. Medics 73-006: Duree Moyenne Normalisee des Sejours en Milieu Hospitalier, Cahier Methodologique, August 1973.
Medics 73-018: Duree de Sejour, Analyse Descriptive, November 1973.
Medics 74-005: Duree de Sejour: Les Characteristics hospitalier, November, 1973.
32. Piere Bergeron, Orientation Generale pour le Traitement de l'insufficance renale terminale du Quebec, March 1975.

33. The Canadian Hospital Association, Canadian Hospital Accounting Manual (CHAM), A Guide to Accounting Principles, Practices and Systems for Canadian Hospitals (Toronto: Ryerson Press, 1968).
34. Archibald L. Chochrane, Effectiveness and Efficiency, The Nuffield Prov. Trust, London, 1972.
35. Castonguay Commission, Volume IV, Tome III, Part 2, page 43.
36. Ibid., p. 71.
37. La Perinatalite, une Politique du Ministere des Affaires Sociales, (Quebec: M.A.S., April 73, p. 84.)
38. Jacques R. Ducharme, M.D., working document, May 3, 1972.

Note to Chapter II

Certification of User Eligibility

Relatively little importance has been placed on the certification of user eligibility, since everyone residing in the Province is eligible for services, and a health file was to be kept on each eligible person, once the total health information system was implemented. Information on family members in this system was to be linked to each individual's file.

As far as hospitalization information goes, such a system has not been implemented, and certification of a patient's eligibility is not always easy (see p. 43).^{*} Often patients do not have their certificate number handy on admission, and verification of the number is considered difficult by the hospital administrators.

RAMQ (Regie de l'Assurance de Maladie de Quebec), which covers any Quebec inhabitant for physician services, without charge at the point of delivery of services, has developed the CP-12, a 12-digit registration number for Quebec inhabitants. This CP-12 will probably be operational in November 1976.

Reasons for developing the CP-12.

Since everyone living in Quebec is eligible for services (eligibility depends on tax payment, but unemployed are covered as well), the question arises why an eligibility number is necessary, when everyone is eligible. There are a number of reasons. Subrogation is probably one of the more important ones. It is very important to be able to verify eligibility in case of third party liability, and particularly when patients receive services who are from other Provinces, or who are non-eligible US or other citizens. (Chpt. 163, Sect.9). Another reason for creating a certification number is the problem of interfacing RAMQ with hospitalization data.

^{*}An on-line file exists for social services users, containing pertinent data on the case.

Presently, hospital and RAMQ data banks cannot be integrated by patient. It is hoped that eventually the CB-12 will be used for interaction between the hospitals and the Ministry, even though not all hospital record libraries will keep patient records by this number. The summary data on each patient, however, could very well be kept in this order. (Hospitals that have no record librarian on duty at night frequently follow a sequential patient numbering system, which allows the patient who is admitted at night to receive a hospital record number at admission. Old records then are referenced to this new number, and added to the new record the day after admission by the record librarian).

The primary reason for the CP-12 is the requirement by law that RAMQ inform each inhabitant at least once per year of the name(s) of the health professional(s) who have provided services to him or her; dates on which these have been furnished; the amount paid by RAMQ for each of these services; and the sum of all reimbursements for that beneficiary. (Law No. 93, Section 14, passed on Dec.24, 1974). A prerequisite of following this law is that RAMQ maintain an updated file (with addresses) of all beneficiaries. Side benefits of this law will be reaped particularly in the Ministry's internal planning, programming and evaluation research programs. Apart from being able to trace patients, regardless of the hospital they attended, a more accurate count of users will also be possible. Approximately two million more RAMQ eligibility cards are presently outstanding than there are Quebec residents. The CP-12 will permit a closer count of eligible persons, in all age groups. While there are more persons eligible than there are residents, on the one hand, there is a problem in registering newborns. It is hoped that the permanent ID number will facilitate both the updating of the file on deaths and births, as well as on immigration and emigration.

Construction and Updating of the CP-12 File.

The number consists of the first three letters of the person's family name, the initial of the first name, year, month, and day of

birth, a column for magnetic twins, and a column for validation, or a total of twelve digits.

Col.#	1	2	3	4	5	6	7	8	9	10	11	12
EXAMPLE:	P	I	G	J	38		01		18		Magnetic Twin	Validation
	First three letters of family name			First Name Ini- tial	Year	Birth Date Month Day for females add 50						

The updating of the CP-12 file is initiated by the letter mentioned above, required by Law No.93, Section 14. Emigrants can thus be eliminated. In addition emigrants to other provinces will be removed by cross-reference with files of other Provinces. Activity on the CP-12 will also be checked. A special effort will be made to establish continued eligibility if there is no more activity on a CP-12. A further cross-reference is possible with the death and birth register (population register). Deaths will be removed from the CP-12 to another file after a short time period; no exact time limit has been established yet. This provision gives providers some time for late listing of utilization. Another possible method of updating the CP-12 is technically possible, but the confidentiality of tax records probably precludes using this source of information.

CHAPTER III

SUMMARY AND RECOMMENDATIONS

The purpose of this study of hospital information systems in the Province of Quebec is to observe and analyze how the Ministry of Social Affairs (M.A.S.) of the Provincial Government integrates data which it acquires in its capacity as planning and accreditation body with the data generated by the Government's financing functions. The information system is of particular interest because it is based on a systematic effort of the Castonguay-Nepveu Commission of Inquiry on Health and Social Welfare to tailor the information system to the requirements of the Ministry of Health and Social Welfare. The Government's long-term objective is an information system which allows it to 1) analyze the overall quality and output of the health plan, 2) to establish Medical Audit Protocols, and 3) to link cost and other financial data to utilization of services.

Presently, the bulk of information flows from hospitals to the M.A.S. and consists of 1) financial data, 2) resource complexity information (types of services and facilities), 3) overall output data by activity centers in hospitals, 4) structural measures of quality and efficiency of care, and 5) a host of miscellaneous other information. The mechanism of gathering this data generally follows the criteria established by the Castonguay-Nepveu Commission for judging the quality of data: the information ought to be pertinent, valid, accurate, provide continuity, be accessible, efficient, and functional. Not all data is collected routinely. Cost/effectiveness principles are applied continuously to determine whether a particular set of data should be acquired on a routine or on an ad hoc basis. Generally speaking, financial and minimal operational data, as well as structural information on quality of care and efficiency are gathered routinely, while Planning depends more on ad hoc analyses. Planning determines the need for a special analysis using these criteria:

1) the prevalence of the problem and its effects on health, 2) the level of direct and indirect costs (including long-term domino effects on other services), 3) the medical potential for intervening effectively, and 4) the degree to which the problem can be alleviated by changes in life style, rather than by health services.

The greatest achievement of the M.A.S. in the information system is that with exceptions, the system does work and does permit M.A.S. to carry out its routine operations, such as financing and accrediting hospitals. Very important is also the flexibility that M.A.S. is showing in adapting the system to changing needs, and the safeguards instituted to assure the accuracy and validity of the data. The uniform accounting data, and detailed reporting forms, the internal and external reviews, special studies, the standardization of medical records and of hospital activity centers are just some of the many techniques used by M.A.S. Of particular interest is the fact that sophisticated efforts at evaluating the efficiency with which services are produced are complemented by structural and process measures of efficiency, as for example in the internal Control Questionnaires, which serve as checklist of the hospital control mechanisms to auditors. Global budgets thus do leave administrators limited freedom only, because the result is not all that counts: structure and process are monitored as well. The presence of adequate control mechanisms thus is considered a minimal requirement for efficiency. This same approach is also taken in quality control.

The fact that such structural and process measures of efficiency and of quality of care are used in addition to outcome measures has been traced in the paper to the lack of uniform results when unit costs per activity center are used as performance measures. This was compared to results obtained elsewhere, where hospitals were not producing uniformly high or low quality care at uniformly high or low efficiency, but where much variation existed in each hospital between activity centers and in treating different diagnostic categories.

This means that detailed data is required not just on activity center performances (costs/unit of output), but also on the units of services consumed by each diagnostic category. This is probably the most surprising change in the perception of the users of hospital information in Quebec. Where they initially were satisfied with the integration of very global cost data with very global utilization information, the information system is now being expanded to provide more detail when the need arises. Thus, where users initially were satisfied to judge hospital performance on unit costs/activity center, adjusted for the numbers of patients in each diagnostic category only, now the numbers of services consumed by patients in each diagnostic category is considered information necessary for control purposes. Expanding the information system so that it can accomodate such frequent demand for patient data is one of the projects of M.A.S. The patient discharge summary form (AH 101) does provide diagnostic data, but no information on the services consumed by each patient. Its replacement will have optional spaces for this data, which can then be collected as needed.

One of the major problems of any data system is to motivate those who collect the data to high standards of accuracy and completeness. Sometimes, because incentives are lacking, the data is of poor quality, and because the data is inaccurate it then cannot be used in an incentive program. This seems to be the case with the patient discharge summary form (AH-101) - diagnostic data is often missing or inaccurate on this form. When the global budget concept was adopted, much thought was given to the amount of detail that should be available on each hospital's patient mix. In the 'standardized budget' concept it was proposed to adjust for patient mix in a global format, i.e. for the numbers of patients treated in each diagnostic category. But, since the patient discharge summary form was mainly designed for reimbursement in cases of subrogation from parties other than M.A.S., its accuracy is not high on the list of hospital priorities. (In matter of fact, subrogation is not high on the list of hospital priorities, since the incentives are

geared toward the hospital not requesting any reimbursement for non-eligible patients. Such outside reimbursements are taken into account when the budget is calculated and subrogation requires paperwork, and such efforts might not always lead to payment. This would be particularly true for U.S. private patients.) Since the data on the discharge summary form is not very accurate, it then is not used in reimbursement or control of hospitals.

The detailed data which will be available with the revised discharge summary form on hospital utilization of services by diagnostic category may also forestall another methodological difficulty. During the past five years hospital performance has moved closer to the norms calculated for activity centers. So far there is still much room for improvement, but it is possible to speculate that in the future all hospitals could fall very close to the norm. More detail will help redefine performance standards.

One must conclude that it is impossible in the planning stage to foresee all necessary changes that must be incorporated into information systems. Therefore information systems need to allow the linking of data pertaining to institutions with information on patients seen by these institutions. Even if this detailed patient data is not necessary for financing of the institutions it will invariably be requested from time to time by those interested in the appropriateness of services provided by institutions and the socially optimal allocation of resources. The main requirement of an information system, therefore, is its flexibility and the open-mindedness of those working with it.

Recommendations

1. It is recommended, therefore, to keep the information system simple and to follow the Castonguay Commission's criteria for quality information: pertinence, validity, accuracy, continuity, accessibility, efficiency, and functionality of data should obtain.
2. The establishment of one single information system which completely integrates all data collected and produced by any agency on hospitals is not recommended, as it is uneconomical and counters many of the criteria for quality information (recommendation 1). However, serious thought must be given to the types of links and interfaces which are required between information banks.
3. Thus, on an ongoing or sample basis not only unit costs for activity centers should be provided by the information system, but also the number of units consumed per patient. There must be a link between patient utilization data and hospital costs and activities.
4. A further link is suggested between physician profiles and hospitals, that is, data on the physician's educational background and activities, as well as on his or her patients must be linked to hospital cost data. This recommendation recognizes the role of the physician in the determination of the nature of services which are consumed by the patient and produced by the hospital.
5. In order to permit an overview of needs and resources, not only hospital inpatient, but also hospital outpatient data must be available. The system must allow linkage of these data. Therefore, a patient identification number is recommended.

6. Decentralizing the flows of information and directing them to the ultimate user reduces the costs of the information system, but it also may lead to duplication of effort. Therefore, it is recommended that serious thought be given to the types and distribution lists of summary reports.
7. All personnel collecting and analyzing data from hospitals and providing feedback to institutions must be familiar with the overall objectives of the Agency and of the information system.
8. Hospital information systems will benefit from close cooperation between providers and those responsible for financing and controlling hospitals not only during the development phase of the information systems, but also when these are operational.

APPENDIX I

SOCIO-ECONOMIC-DEMOGRAPHIC-GEOGRAPHIC ENVIRONMENT

To put global budgeting and its information requirements and generation into its proper perspective in the Province of Quebec, it is necessary to give a brief description of the environment for those who are not familiar with the province.

1. GEOGRAPHIC DISTRIBUTION OF THE POPULATION

The population of 6,134,000³⁹ people live in an area of 596,336 square⁴⁰ miles. However, most of the inhabitants live within a 200 mile belt of the U.S./Canadian border. When one therefore looks at population densities for the 10 health regions into which Quebec has been organized, the density ranges from .06 for New Quebec to 7,685.3 inhabitants per square mile for Metropolitan Montreal.⁴¹

Thus, even though the population to be served by the Ministry of Social Affairs (which provides funds for both health and social services) is not very large in absolute numbers, the wide dispersion of inhabitants in many areas poses difficult problems.⁴²

This can also be seen when one examines the size of municipalities. 38.9 per cent of the population live in 13 municipalities with more than 50,000 inhabitants, 14.5 per cent in 31 municipalities with between 20,000 and 49,999 inhabitants, and 10 per cent in 41 municipalities with from 10,000 to 19,999 inhabitants. The remaining 36.6 per cent of the population live in the 1,653 municipalities with less than 10,000 inhabitants. Of further interest is the fact that of the 6,080,050 people in the Province, 1,794,126 live in the Metropolitan area of Montreal.⁴³ In the Province, one often talks of the cross of Quebec - which can be constructed by connecting the 7 largest population centers with lines. This population distribution does by necessity affect the planning and the distribution of services. Thus, services are provided in some areas where they could not be justified on solely economic

grounds, because transportation problems require that such a service be available on political and medical grounds. A good example of such a case is the provision of maternity services in hospitals that have fewer than 500 births per year. Thus, while it is an objective of the Government to consolidate maternity services so that all births will take place in hospitals with more than 2,000 births, exceptions have to be made for less populated areas.⁴⁴ In general, however, the M.A.S. follows a policy of regionalization of services, as outlined in the Castonguay Report.⁴⁵

2. DEMOGRAPHIC DATA

Since 1970, the population of Quebec has experienced a low birth rate. Births and new immigrants contributed to a small increase in total population each year.⁴⁶

Table 9: Percentage Population Increase (In Percent) - June 1

	<u>1971/70</u>	<u>1972/71</u>	<u>1973/72</u>	<u>1974/73</u>
Quebec	.2	.4	.5	.9
Canada	1.3	1.2	1.3	1.6

Raymond Garneau, Budget Speech 1975-76, (Quebec: Gov. of Quebec, Dept. of Finance), April 15, 1975, p. 81.

3. SOCIO-ECONOMIC DATA

Per Capita Personal Income in Quebec has been below that of Canada for the past 4 years, but the difference between these two indicators has decreased somewhat as Quebec has experienced a slightly higher growth rate in GNP in the last two budget years, 1973/74 and 74/75. It is not quite clear to what extent this growth in Quebec is due to inflationary pressures (as a deflated GNP figure was not readily available). It is very likely that whatever gains have been made are due to inflation and not to real growth. One other indicator may confirm this possibility, that is the unemployment rate, which according to latest reports may

have reached 10 per cent during 74/75. But even in years prior to 1975 it was higher in Quebec than in Canada on the average.⁴⁷

The Provincial Governments programs are financed by a Quebec income tax. Provincial income tax rates for married taxpayers range from .1 per cent gross income from earnings of \$6,000 to 6.2 per cent on \$10,000⁴⁸ and 14.2 per cent on \$25,000 gross income.

The most important industries are the exploitation of primary resources (wood and woodpulp; mining; generation of electricity with water power) and some secondary industries, such as the production of paper and various metals. Tourism is important as well.

4. POLITICAL RELATIONSHIPS

Quebec is a Province of Canada. Its history, eastern location, its predominately French-speaking population, and different culture set it apart from the remainder of Canada on many political issues. Rapid political and economic development since 1959 explains some of the contradictions, for example in the health care system, where a sophisticated information system co-exists with at times very outdated medical record departments in hospitals. As far as health care goes, the federal government enforces minimum performance of Provincial hospital care delivery systems by a cost-sharing provision for hospitalization expenditures. All provinces contribute taxes to the Canadian Government, and provide information on the consumption of hospital care. They are reimbursed on the basis of 25 per cent of the per capita Canadian expenditures on hospital care and 25 per cent of the per capita Quebec expenditures on hospital care. Thus approximately 50 per cent of hospital care expenditures is provided by the Federal Government from general revenues. Medical (Physician) care expenditures by Quebec residents are also matched by the Federal Government. There have been several proposals to change the Federal Provincial relationship on this issue. The two most interesting proposals were 1) for the Federal Government

to yield the tax revenue sources to the Provincial Government and 2) for the Federal Government to establish its total yearly commitment to Provinces in dollars rather than to agree to share a percentage amount of whatever expenditures are incurred.⁴⁹

5. HEALTH MANPOWER - RESOURCES AND UTILIZATION

In 1973, there were 8,216 physicians practicing in the Province, as well as 420 Dental and Oral Surgeons, and 570 Optometrists.⁵⁰ From 1971 to 1973, a slight shift in the distribution of General Practitioners versus specialists has occurred,⁵¹ which has been described by some to the fact that General Practitioners and Specialists are reimbursed according to the same fee schedule. This reimbursement scale has been considered a possible incentive to physicians to remain in general practice.

Table 10: Evolution of the Distribution of Health Professionals by Category

	1971 Percent	1972 Percent	1973 Percent
General Practitioners	37.44	39.10	39.99
Medical Specialists	50.88	49.93	49.26
Dental and Oral Surgeons	6.52	6.21	6.19
Optometrists	5.16	4.76	4.56
TOTAL	100.	100.	100.

The rate of physicians per 100,000 inhabitants varies widely from 18 for Nouveau Quebec to 159 for the Region Cantons de L'Est, with an average of 135 physicians per 100,000 for all of Quebec.

The per capita costs for physician services (and the per capita number of services) have developed as shown in Table 11.⁵²

Table 11: Per Capita Cost (and Number) of Services 1971-1974

Category of Service	<u>1971</u>		<u>1972</u>		<u>1973</u>		<u>1974</u>	
	\$	N	\$	N	\$	N	\$	N
Physician	45.44	(5.34)	49.91	(5.77)	55.18	(6.29)	61.25	(6.82)
Oral Surgery	0.08	(0.43)	0.48	(0.09)	0.47	(0.08)	0.48	(0.08)
Optometry	0.16	(1.30)	0.18	(1.48)	1.72	(0.21)	1.91	(0.24)
TOTAL	45.68	(7.07)	50.57	(7.43)	57.32	(6.58)	63.64	(7.14)

The average per capita cost of physician services is of interest because that is the amount residents in the Province pay on the average for the benefits provided by RAMQ (Regie d'Assurance maladie de Quebec). The per capita number of services is of less interest than the consumption of services by those who utilized their coverage for physician services. The number of services consumed per user was 8.73 for women and 6.71 for men on the average in 1971-72.⁵³ However, the number of services consumed range from 4.20 for the 10-14 year olds to around 15 for the over 65 year olds. 64.46 percent of the women and 51.63 percent of the men saw a physician in 1971-72 at his office, and 17.71 percent of the women and 13.86 percent of the men underwent a surgical procedure during that time period.⁵⁴

The cumulative percentage distribution of the number of physician services received is shown in Table 12. (Cumulative percentages of costs per beneficiary are very similarly distributed.)⁵⁵

Table 12: Cumulative Percentage Distribution of Beneficiaries According to Number of Services Received, Fiscal 1971-72 (by sex)

<u>Services</u>	<u>Men Percent</u>	<u>Women Percent</u>	<u>Total Percent</u>
0+	100.0	100.0	100.0
1+	64.6	73.2	68.9
2+	48.4	59.8	54.2
3+	37.1	49.2	43.3
4+	29.8	41.4	35.7
5+	23.6	34.5	29.1
7+	16.1	25.2	20.7
10+	9.7	17.2	13.5
15+	5.5	9.4	7.5

Appendix I: References and Notes

39. Raymond Garneau, Budget Speech, 1975-76 (Quebec: Gov. of Quebec, Dept. of Finance) April 15, 1975, p. 81.
40. A. Hurtubise, Dossier Regional, Donnees statistiques par regie socio-sanitaire, Annexe du rapport annuel 1973/74 (Quebec: Ministere des Affaires Sociales) April 1974, p. 5.
41. Ibid.
42. Claire Dussealt, Des Medecins de garde 24 heures par jour au Ministere, 65 a l'heure, Dec. 1974, Vol. 2, No. 7, p. 6 (description of a 24 hour aerial rescue service maintained by the Government of Quebec, so that patients in outlying areas have access to specialty care in the regionalized health care delivery system in the Province.)
43. A. Hurtubise- op. cit., pp. 6-7.
44. Ministere des Affaires Sociales, Direction des Communications Projet de Regroupment des Services Obstetriques, (Quebec: Ministry of Social Affairs, 1974), p. 4.
45. Castonguay Report: Regionalization.
46. A. Hurtubise, op. cit. p. 19: birth rate in 1972 was 14.01 and death rate was 7.02 per 1000 inhabitants, while there were 8.91 marriages per 1000 inhabitants.
47. Raymond Garneau, op. cit., p. 81.
48. Ibid., p. 46.
49. For further details of the political and cultural self-image of the Quebecois, see:
Marcel Rioux, Les Quebecois, (Bourges, France: Tardy Quercy) 1974, in the series "Le Temps Qui Court".
50. RAMQ, Statistiques (Quebec: Service de la recherche et des statistiques,) 29 Jan., p. 14.
51. Ibid. p. 15, Annex I.
52. Ibid. p. 13, Annex I.
53. Ibid. p. 20, Annex II.
54. Ibid. p. 20, Annex II.
55. Ibid. p. 23, Annex II.

APPENDIX II

Non-Allowable Expenses

2. Arriving at Base for Applying Price Increase Index

3. Global Component tied to Price Increases

Projections
for other
items

5. Global Budget

6. Total Budget

Self-Supporting
Items

Ancill. Operations: cafeteria, parking, data processing, free medical clinics, prostheses, misc. Other: Pensions for past service, unauthorized retirement fund, etc.

Self-Supporting Items

Parts of Budget
Partially Sub-
sided by
Province

Protected Budgets: family care, free dental clinics.

Other: debt service, interest on loans, leases, equipment purchase, major repairs.

Misc.: allowances to mental patients, research and pilot projects, free drugs (glaucoma, cancer), protected workshops, etc.

Family & free
dental care

	Cap. Expenditure	Budget
1. Buildings	100	100
2. Equipment	50	50
3. Land	20	20
4. Other	10	10
Total	180	180

Special Budgets

Allowable Expenses

Total Approved
Operating Ex-
pense Budget

Not tied to price increase index:

Tuition for hospital school children
Community Health Care Centers (pro-
tested budget), prevention: dental,
home health, and school health.

Tuition
Communi
Health

Medical Instruction
New 1974 Services
Services Closed in 1973/74
Specialists

Salaries of Supervisory Personnel
Fringe Benefits (Cafeteria)
Social Work
Psychiatry in Gen. Hospitals

Global
Budget

Supervisory
Salaries, Per-
son. Upgrading
Psychiatry

Operating Expenses

Directly tied to price increase
index

Global Component
tied to price in-
creases

APPENDIX III

Not Allowable Expenses (Part I)

1. Total Gross Budget	2. Income from Sales & Services to Other than Patients	3. Income from Pts. for Not Covered Services	4. Total Hospital Revenues	FINANCING Payment: Once/yr or every 3 mos. Payment: Every Two Weeks
Self-support Items			[Cafet., etc]	Special Subsidies
Family Care			[Fam. Care]	Periodic Payment
Free Dental Clinics			[Free Dental Clinics]	[Fam. Care]
Capital Expenditure Budget			[Provincial & Private Subsidies, Trust Funds]	[Free Dental Clinics]
Pilot & Research Projects			[Provincial & Private Subsidies, Trust Funds]	[Cap. Equipment (M.A.S.)]
Budgets recognized by Financing Dpt.			[Provincial & Private Subsidies, Trust Funds]	[Service of P.H. & Research Proj.]
School Expend. for Hospital Children				[Special drugs, Allowances to Mental Patients]
Comm. Health				[Provincial Subsidies]
Psychiatry (Gnl. Hosp.)				
Operating Budget 1975				

APPENDIX IV

Calculating the "normalized budget" *

Simplified illustration of the application of information to management analysis

1. Since, in several parts of the report, particularly in the chapter on financing, there are references to information which makes it possible to analyze and evaluate management, it is in order to provide an illustration here. This information sometimes is called "normalized budget" but it is more a standard of evaluation of administrative output (in the broad sense), of a technique, so to speak, of the proportion and quality of information relating to management of execution units, than a "budget", properly speaking.

2. We shall deal with a concrete example of application of the normalized budget — in this case, a laboratory service — and we shall specify the ideas without hindering the general nature of the description. In effect, at different levels, the "normalized budgets" of the various levels of the system (RIO, CHC, LIIC) are conceived as synthesized budgets, grouping, by simple addition, the normalized budgets which have been established only for services clearly related to a distinct activity. Thus, the laboratory service has a normalized budget which integrates with that of the unit (LHC) to which it belongs.

3. The preparation of a normalized budget involves four principal elements:

- 1° an estimate of the coefficients of costs attached to variable elements of the functioning of the service in question;
- 2° an estimate of the coefficients of utilization of services with relation to their demand;
- 3° a formula to calculate the contractual components of the normalized budget;
- 4° a formula to calculate the normalized budget itself.

*Source: The Report of the Castonguay Commission, Volume IV, Tome III, Part 2, pages 99 to 104.

4. Estimation of the coefficients of costs requires information on each of the laboratory services affiliated to an LHC or a CHC. The necessary information deals with the total expenditures of each of these services, the volume of examinations of various types effected and other indications (for example, on the laboratory equipment available for automatic analysis). This estimation is made by using a stringent statistical method (for example, the method of linear regression with several variables); statistical criteria determine in large measure the specification and number of data necessary for a valid estimation. Hypothetically, we state that this estimation leads to the following result:

(1) *Total operating cost of the LHC laboratory:* $\$45,000 + \$0.28 \times LU^* - \$15,000 H^{**}$

5. This equation simply states that the operating cost of the laboratory service reaches the fixed sum of \$45,000 per year, plus \$0.28 per unit, and that it is reduced by \$15,000 per year if the laboratory serves both an LHC and a CHC¹.

6. This estimation of the coefficients of costs gives as exact a measurement as possible of the repercussion, on operating costs, of a more or less extensive use of the service in question (use measured by the number of laboratory units carried out). This information is capital in evaluating the management of a particular unit, much more than is the average cost, whose formula is written as follows:

$$(2) \frac{\text{Total operating cost}}{LU} : \frac{\$45,000 + \$0.28 LU - \$15,000 H}{LU}$$

7. In effect, the fixed portion of operating cost does not necessarily reflect a management decision but, for example, the existence of a certain "laboratory analysis capacity". This capacity, used or not, involves costs, by definition, which do not vary with relation to the volume of the service's activities. When it is a surplus, it increases the average cost per laboratory unit, while the cost of an additional unit perhaps may compare advantageously with that of other laboratory services. This cost of \$0.28 per unit — or, in technical terms, the marginal cost of the laboratory unit — is an operational variable in management, when, for example, the advantages of using outside laboratories is determined. Finally, the relationship between marginal cost and average cost

*LU: laboratory unit.

**H: hospital (this is a fictitious variable which here takes the value 1, and 0 in the other cases).

¹ Here, the figures are chosen arbitrarily and the example is simplified. In particular, we do not refer to the manner in which the factor "laboratory unit" (LU) is defined and we also suppose, arbitrarily, that the use of the same laboratory service by an LHC and a CHC is reflected on the proportion of operating cost, rather than on the value of the coefficient of cost. The same statistical techniques remain valid, however, even with these complications. Their examination here would uselessly burden this summary explanation.

is an important planning element. A laboratory service must be envisaged to carry out a number of analyses (normalized units) *at least* large enough so that the disparity between average cost and marginal cost compensates for the fixed cost charged to each unit¹.

8. Finally, we should specify that the estimation of cost in question does not refer to an "average" laboratory service where the operating cost results from indicated factors. On the contrary, this estimation reflects the situation of all laboratory services, taking into account not only the number of units of analysis carried out for each but the other determinant cost factors. The numerical values of estimated coefficients are average values in this very special sense and not in the ordinary sense by virtue of which an average cost is obtained by dividing the total of costs by the total of normalized analysis units.

9. The second information element necessary for the analysis of management deals with an estimation of the coefficients of utilization of the service studied. In effect, the patients or, more generally, those who frequent health centres do not themselves determine the intensity of their recourse to various services — to the laboratory service, for example. On the contrary, this recourse is determined within the medical system itself by some sort of shunting process.

10. In this process, a multitude of administrative and clinical influences intervene. It is possible to study the results statistically. So as to pursue the illustration, it is supposed, without overfalsification of reality, that it is possible to identify statistically three major categories of users of health centres whose clinical characterization involves implications which statistically are very distinct, with respect to utilization of medical laboratory services. Consequently, the following function of utilization of the laboratory service is set forth:

$$(3) \text{ LU : } 12.6 D_1 + 44.5 D_2 + 124.8 D_3 + 1,879 \text{ MT}$$

11. Here, as earlier, LU designates the number of normalized units of analysis in each laboratory service belonging to the group studied. D_1 , D_2 and D_3 designate, for their part, three categories of users defined according to statistical characteristics and regrouping perhaps highly heterogeneous clinical classifications. The respective coefficients of these variables represent the standardized or "average" use related to presence in the system of a user

¹ This estimation of cost, with a view to illustration, leads us to envisage the possibility of realizing large-scale savings, theoretically unlimited. Without going into the validity of this illustration, the rule to which the text refers constitutes only an approximation which guarantees, at very least, that the average cost for the whole of the system of the normalized unit of analysis does not increase with the creation of an overly restricted laboratory service.

of each of the categories. The factor MT symbolizes the presence of a medical teaching function in the CHC, to which certain laboratory services are affiliated; it allows a better specification of the other coefficients and makes way for direct usefulness.

12. Whereas the estimation of cost of the normalized unit provides a comparative evaluation of laboratory services with relation to this element, the estimation of the standardized utilization of services allows the same type of comparative evaluation of recourse to services in question with regard to actual "demand" for these services.

13. With the help of these two elements of information, it is possible to better define a normalized budget which is an instrument for comparative evaluation of the laboratory service, both from the viewpoint of its cost and that of utilization. As a first step, the contractual component of the "normalized budget" is determined. This component is that which does not vary with relation to the volume of activities carried out by the service in question. But this does not imply that this contractual element is uniform for all the laboratory services. In the example used up to now, this contractual component is established by the following formula:

$$F_{\text{laboratory 'k'}} : \$45,000 - \$15,000 H + \left[(1,879) \times (\$0.28) \right] MT$$

14. Here is its significance. The contractual portion of the normalized budget of a particular laboratory service is the sum of several elements: the "fixed cost" identified by estimation of costs as independent from the volume of laboratory activities; a possible contract written off this fixed cost if the laboratory service serves both an LHC and a CHC; finally, a firm sum to the service envisaged, representing the total cost of units of a laboratory with a medical teaching function and which is added to that of units which reflect, in the absence of a teaching function, the presence of specific categories of users within the LHC and CHC in question.

15. The fourth and final element in calculating the normalized budget is illustrated by the following formula, which serves to evaluate this normalized budget on the basis of elements described earlier:

$$(4) N.B._{\text{laboratory 'k'}} : F_{\text{laboratory 'k'}} + 0.28 (UL)^*_{\text{'k'}}$$

16. In other words, to the contractual component described above is added a variable component to arrive at the normalized budget. The latter is calculated by multiplying the coefficient of the standardized marginal cost obtained in the equation by the number of laboratory units, not really carried out by a particular laboratory service, but by the number of laboratory units

corresponding to the standardized result, in conformity with the equation (2), in the number and distribution of users of this particular laboratory service, during the period in question, that is:

$$(5) (LU)^*_{k'} : 12.6 D_1^k + 44.5 D_2^k + 124.8 D_3^k$$

17. It may be inferred from this example — and despite the extreme simplifications and its rather arbitrary nature — that the normalized budget thus conceived does not impose compulsory adjustments on health services. The normalized budget of a given service is “individualized” because it reflects all the identifiable influences which systematically modify the conduct of services of this type to the extent that these influences are exercised in a given service. On the other hand, this normalized budget is an excellent evaluation instrument since its conception shields it from the consequences of management of this service: a more intensive use of this service does not increase it. On the contrary, an increase in utilization of the service, if it raises it to a level higher than that indicated by the standardized practice of other laboratory services, produces a negative indication of the output of the service in question.

18. The utilization of data on the volume of activities of all the services of a same category, with a view to evaluating the output of one among them, implies that this evaluation, strictly speaking, cannot but be retrospective. For example, the normalized budget is calculated definitively only at the beginning of a quarter, for the preceding quarter. However, when the coefficients are known — the change is of little significance from one quarter to another since, in a way, they represent a standardized average — those responsible for the management of each of the services, who know, in addition, for the preceding quarter, their relative position with regard to all the services of the same category, use it as a guide to correct their operations, should the need arise.

19. An output indicator may easily be developed for each service with the help of the normalized budget, by expressing the real operating cost of the service in percentage of the normalized budget¹. Through an indicator of this

¹ This way of proceeding paradoxically gives a higher indicator the poorer the output. The paradox may be eliminated by defining another indicator of output as follows:

$$100 \times \left[1 - \frac{\text{Real expenditures}}{\text{Normalized budget}} \right]$$

which will have a positive value (equal to 10 if real expenditures are equal to 90 per cent of the normalized budget) for a good output and a negative value (equal to -20 if real expenditures are equal to 120 per cent of the normalized budget) for a mediocre output.

type, the incentives and other administrative measures envisaged, which depend on an evaluation of output, may, for example, be related. In addition to this role as an output indicator, the calculation of the different components of the normalized budget leads to a rather complex administrative review as a result of which the administrator has an analysis of his management. In this way, the cause of a mediocre output (for example, a value of the output indicator of -15) may be detected in an "excessive" utilization of the service with relation to a given category of users; there is an excessive marginal cost for each unit, etc.

20. Finally, use of the normalized budget for indicative rather than imperative purposes distinguishes it clearly from the traditional budget of limitative nature. The normalized budget is not the equivalent of a spending authorization; it has an informational value as much for the administrators as for the agencies which evaluate management. For this reason, the normalized budget is the outcome of applying strict methods of estimation and not of a process of administrative arbitration.

[illegible]

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